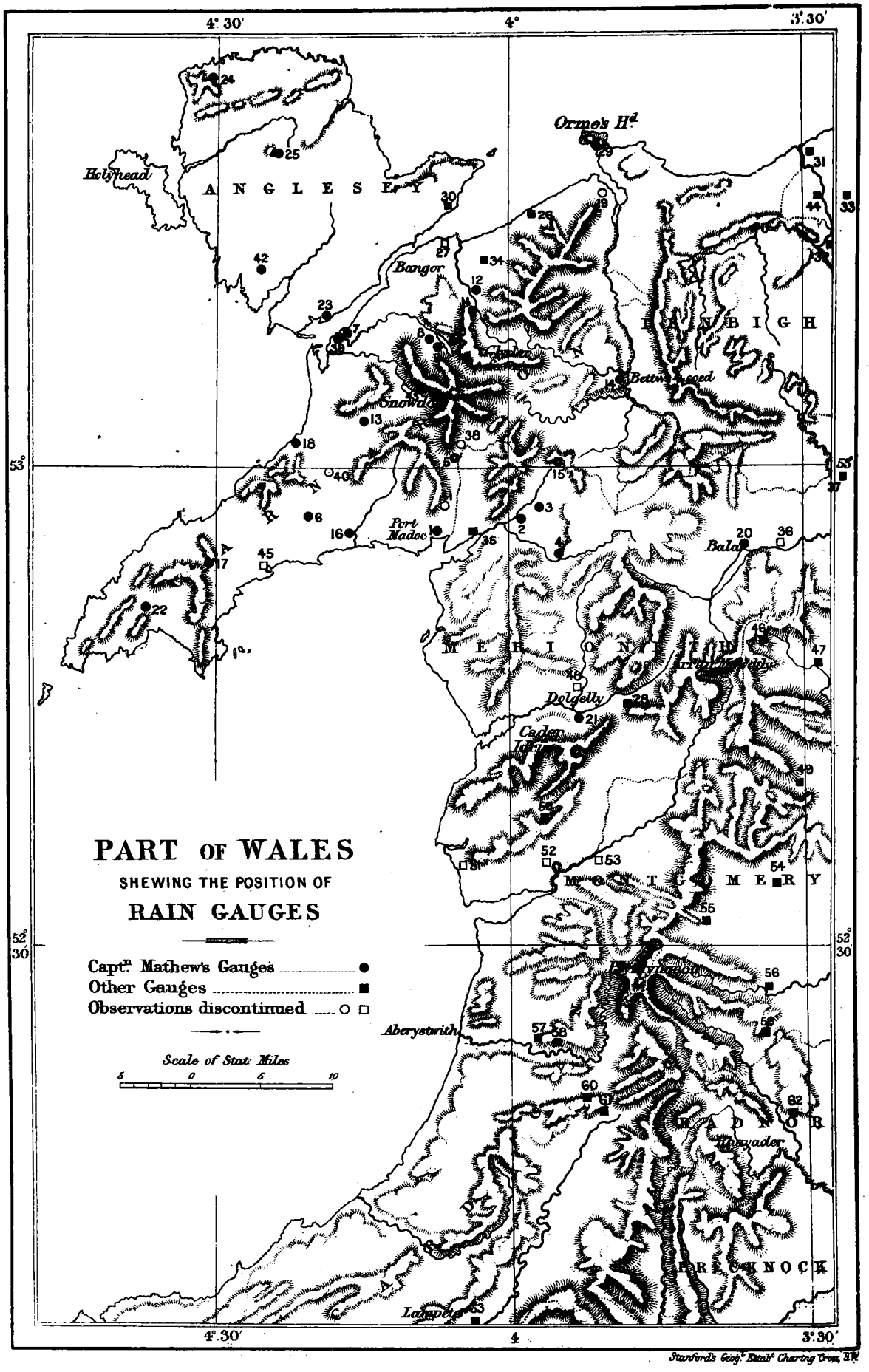

Stanford's Geog.l Estab.t Charing Cross, S.W.

BRITISH RAINFALL, 1867.

ON

THE DISTRIBUTION OF RAIN

OVER THE

BRITISH ISLES,

DURING THE YEAR

1867,

AS OBSERVED AT ABOUT 1300 STATIONS IN GREAT BRITAIN AND IRELAND,

WITH REMARKS ON VARIOUS EXPERIMENTS, AND ILLUSTRATIONS.

COMPILED BY

G. J. SYMONS, F.M.S.,

Member of the Scottish Meteorological Society.

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1868.

NOTE.

The Author being very anxious to make these Tables as complete as possible, will be obliged by information of, or from, any persons who record the fall of rain in the British Isles, but who have not hitherto communicated their observations to him. He also desires to be informed of any registers of the fall in previous years, however remote the place or period of observation, or however long discontinued.

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ERRATA IN BRITISH RAINFALL, 1866.

Page 34.—Calne. Total fall in 24 in. gauge, *for* 33·167 *read* 33·867.
,, 84.—Hampstead. *For* 33·90 *read* 33·80.
,, 85.—Clapham. Rainy days, *for* 177 *read* 187.
,, 87.—Newbury (Speen). *For* Rev. L. M. Majendie *read* Rev. H. W. Majendie.
,, 90.—Saxmundham. *For* 29·93 *read* 27·93.
,, 92.—Sidmouth (Salcombe Hill Ho). Strike out the asterisk.
,, 102.—Oakhurst. *For* 47·68 *read* 46·68.
,, 102.—Patterdale cannot have had 315 days rain.
,, 103.—Strike out the word Langharne.
,, 104.—Festiniog. *For* Blaenyddob *read* Blaenyddol.
,, 108.—Before (Hynish) enter Tyree.

NOTE.—If correspondents will be kind enough to write distinctly, and make their figures unmistakeable, it will curtail the table of errata, and save much time. I am ure they will excuse this hint.

BRITISH RAINFALL, 1867.

Through the continued courtesy of more than a thousand correspondents, I have the pleasure of issuing the Eighth Annual Statement of Rainfall in the British Isles, that for the year 1867. While conscious that in accuracy and completeness with reference to last year it is fully equal to any of its predecessors, I trust the essays in the earlier part of the volume will prove equally acceptable.

The publication is a few days later than usual from three causes—(1) the tardiness of a *few* of my correspondents; (2) the difficulty of getting communications from the lesser Islands of the Hebrides and Shetlands during the winter months; (3) owing to the increased number of returns, more time is required for their verification and for their careful reading against the proof-sheets. As I have stated in previous years, the tables are not only read against the MS. in the usual way, but also against the observers' returns, hence the remarkably small list of errata on the opposite page.

G. J. SYMONS.

136, CAMDEN ROAD, N.W.
Feb. 24th, 1868.

REPORT

THE branches of rainfall investigation herein referred to, necessarily change from year to year, as the various subjects either increase so much in importance as to claim separate notice for themselves, or, on the other hand, are wrought to a conclusion, and either established among the rules for the guidance of observers, or dismissed from further consideration. Many things, also, which were primarily noticed here as desiderata, and subsequently as commenced, are now simply matters of routine—all important and interesting, but concerning which, there is little calling for special notice. Take for example the subject of the examination of rain gauges first mentioned in 1862, which has been going steadily on, until it appears that I have visited and tested upwards of 240 gauges—one or more in each of the following counties, the enumeration of which, will show their wide and irregular distribution :—

ENGLAND.

Bedford	Devon	Lancashire	Northampton	Suffolk	Westmorel and
Cambridge	Durham	Leicestershire	Northumberland	Surrey	Wilts
Cumberland	Hampshire	Lincoln	Nottingham	Sussex	Yorks
Derby	Kent	Middlesex	Rutland	Warwick	

WALES.

Carnarvon	Denbigh	Flint

SCOTLAND.

Aberdeen	Forfar	Kincardine	Orkney

The results of 166 examinations were published in the *British Association Report* for 1866, and those of about 70 will appear in that for 1867. The entries have hitherto stood thus :—

EXAMINATION OF RAIN GAUGE.

Reference Number	53.
Date of Examination	1863, April 6.
County	Sussex.
Name of Station	St. Leonards, Marina.
Owner and Observer	J. C. Savery, Esq.
Construction of Gauge	III. (Numerals referring to a series of engravings).
Maker's Name	Casella.
Time of Reading	Daily, 9 a.m.
Height of Gauge above ground	Level.
,, ,, sea level	31 ft.
Diameters (that marked M = mean)	5·00, 5·02, 5·01, 5·00, M, 5·007.
Equivalents of Water { Scale point	·1 ·5
Grains }	500 2510
Error at Scale-point specified in previous column	—·001 —·005
Remarks on position, &c.	In yard at back of Marina; very much sheltered by buildings on S.E., S., and S.W.

The effect of these visits is varied, but uniformly beneficial. Those who are subjected to them, are frankly told of any departures from ordinary custom or established rules; and the consciousness that "there's a chiel amang ye takin' notes, and faith he'll print 'em," acts beneficially on very many whom I can hardly hope ever to visit personally. For it is seldom that more than twelve stations a week can be visited—and at that rate which could hardly be maintained—it would take two years *incessant* work to visit them all; so, with fragments of time only available, it will, indeed, be a lengthy process. However, with nearly a sixth of the gauges tested, I adhere to my motto, "*nil desperandum.*" Probably, future examinations will be yet more serviceable, because I have recently designed the little instrument represented in the following figure—the object may as easily be explained as the *modus operandi*. The influence of trees or houses on the indications of rain gauges depends obviously neither on their height nor their distance, but on the relation of one to the other—in other words, the suitability of any position for a rain gauge depends on the angle which is subtended by the top of surrounding objects, which I have always held should never exceed 30°.

The altameter represented in fig. 1 is an extremely simple instrument, depending on two infallible laws, (1) gravity, and (2) the angles of incidence and reflection are equal. It consists of a brass tube, 6 in. long, and three-quarters of an inch in diameter; near the top are double gimbals (c), by the outermost of which the instrument is suspended between the fingers, when, of course, the body assumes

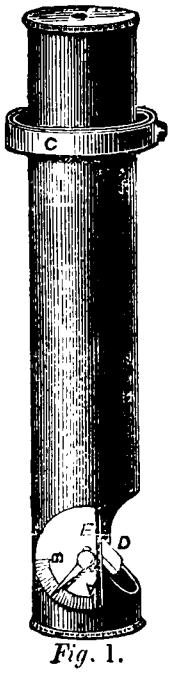


Fig. 1.

a truly vertical position. At the lower end is a small mirror, (D), turning on a horizontal axle, whereof one end is prolonged at (E), and carries a pointer on the graduated arc (A B). If the mirror is (as represented) at an angle of 45°, objects level with the mirror will be seen in its middle, by looking through the small eye-hole at the top; but, if objects are above its level, the mirror must be turned by the axle (E) into a more horizontal position, and when the objects are seen crossing the centre of the mirror, the index will be found as many degrees towards (A) as the objects are above the instrument. It is, perhaps only fair to state that Mr. Pastorelli, of Piccadilly, has turned out the little altameter in his usual satisfactory manner, and that those who have seen it, approve its simplicity, and the apparent impossibility of error.

ALTITUDE ABOVE SEA LEVEL.

Among the many difficulties of preparing the general tables at the end of this work, not the least has been to ascertain the altitude of the various stations above the level of the sea. Although, perhaps, there are few parishes which have not been levelled through, either for road, rail, drainage, or canal works, yet the results are often destined to interment in the drawers of engineers, and ultimately to destruction, as waste paper. The levels of the Ordnance Survey are almost the only ones available for general use, and to their datum (the mean level of the sea at Liverpool) all are now referred. But, except in the Northern Counties, and along certain main roads, their levels are untaken, or, at any rate unpublished, 'though under the guidance of Captain Edward James, R.E., they are being pushed steadily forward. There are still however large tracts in which no levels have been taken (*e.g.*, Bury St. Edmunds, 15 miles from the nearest bench mark), and, for the use of observers in such districts, arrangements were made last spring for a ten day series of simultaneous barometer readings, the returns being sent to me; and the approximate altitude of the stations therefrom deduced have materially helped to extend our knowledge in this respect. Further assistance was afforded by the offer (in the *Meteorological Magazine*) of information, so far as lay in my power, as to the altitude of churches, or other prominent

objects, near the residences of the various observers. Lastly, it has for some years been my constant habit to take a series of aneroid observations whenever travelling by road or rail; and thus fair approximations to the altitude of some hundreds of railway stations have been obtained. Glad as I am to see the altitude column steadily filling, I wish to feel more certain of the correctness of the values, and also to sweep away the numerous queries which exist in that column. Towards effecting this, I renew an offer previously made, viz. :—"We can only say that, any of our readers who are uncertain of their altitude, and will send us the position of their houses in the following form,—

"The Limes, Johnstone, Derbyshire,
"Quarter of a mile South of Johnstone Church,

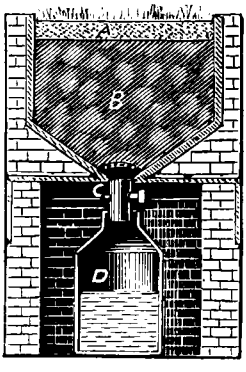
"shall be assisted to the best of our power."

In all except mountainous districts, the amount of rain collected increases about 2½ per cent. per 100 feet of increased elevation; therefore it is evident that in the greater part of England an error of 50 ft. in the height above sea involves an error in the amount of rain indicated (30 in. ÷ 100 × 1·25 = 0·38) about four-tenths of an inch.

EVAPORATORS AND EVAPORATION.

The Astronomer Royal at the Manchester meeting of the British Association described meteorology as one of the most desperate sciences with which we have to do. I almost think the most desperate branch of this desperate science is evaporation. *Prima facie*, it seems simple enough to ascertain how much water is taken from the earth's surface; but a little consideration will show that it must vary with (1) the nature of the soil and subsoil; (2) the inclination of the ground; (3) the aspect of the ground; (4) the presence, or otherwise, of vegetation; (5) the nature of the vegetation (some plants give off twice the moisture others do); (6) almost every variation in climate; certainly temperature, humidity, rain, wind, sunshine, and cloud; (7) I would add the physical characteristics of the district, proximity to sea, and altitude, but that their effects ought to be detected by a strict knowledge of the meteorology of the district, implied by condition (6). How many of these requirements are fulfilled by a few pints of water in a metal vessel four or five feet above the ground? Yet this is the almost universal method of determining the amount of evaporation. Was I not justified (page 43) in saying, "I don't believe in evaporators." My friend Mr. Fletcher him

self sees their fallacy, and points out some of their faults; but, though experiments, on a limited scale, have been tried from time to time, the question has never been fairly grappled. Good suggestions have been dropped here and there; and, before anything is actually commenced, all previous experiments—those of Dalton, Charnock, Daniell, Howard, Miller, Buist of Bombay, Golding of Copenhagen, Haughton of St. Helena, and others, must be reviewed.



It appears to me that a rather troublesome and costly process is necessary before we can at all presume to decide on any instrument for general use, and that it should take the form of a series of experiments, with compartments of a cubic yard each, sunk in the ground, waterproof, funnel shaped at the bottom, with taps and cans. The simplest mode of carrying it out would probably be to cut a trench about 30 ft. long, and 6 ft. deep, in a spot where perfect drainage could be secured, and then form the cubes in brickwork, lined with Portland cement, leaving a sunk path in front, to give access to the cans, as shown in the section of one. The cubes could be filled with various substances; and by their modification, and at one time leaving the taps (c) open, and another closing them—by leaving them with no water but the rain, and at other times keeping their contents in a state of saturation, we should not only go far beyond anything that has been done before, but should probably be led to some simple form of instrument which, even if not itself correct, might bear a known per-centage of error, and be available for differential results.

Wherever these or similar experiments are tried, a regular record must be kept of the dry and wet bulb thermometers, and it may also be expedient to try the self-registering hygrometers invented by Mr. Vivian, of Torquay, and exhibited at the Oxford meeting of the British Association.

GROUND PLAN.

Water.	Grass on Clay.	Grass on Sand.	Grass on Soil of District.	Corn on Soil of District.	Roots on Soil of District.	Soil of District. No Vegetation.	Peat.	Water.

RAINFALL IN NORTH DERBYSHIRE.

In one respect, I have to report addition to our knowledge of the rainfall of this district; but the most interesting and important portion is as neglected now as it has been for the last twenty years.

The flatter country round Derby is pretty well represented by gauges at Derby, Spondon, West Hallam, and Morley, also at Belper and Chesterfield. We welcome this year the addition of Willersley and Matlock, which appear to have only about 5 in. more than Derby, and much the same as Chesterfield, while Buxton has apparently a mean fall of about 62 inches.

The information concerning the Peak district remains stationary, although, perhaps, modern modes of treatment may induce the observations to tell us more than they did when they were first made. From the data given in the "*Memoirs of the Literary and Philosophical Society of Manchester*," it appears that the mean fall on the flank of Kinder Scout, at 1,600 ft. above the sea, is nearly, if not quite, 70 in. This, at 50 miles inland, and more than 100 miles from the sea in the S.W., is a most unusual result, and one surely well worthy of scrutiny.

The Peak is close to Manchester, was, I believe, thought of as a source of water supply for Manchester, and what little we know of its rainfall we owe to Manchester men.

May I remit to the members of the Literary and Philosophical Society of Manchester the desirability of their investigating the rainfall of the district. It will not be troublesome, need not cost £50 altogether; and, lastly, the results would form a worthy sequel to the papers on rain by Dr. Dalton and others, which are to be found in their valuable "Memoirs." I leave the matter in their hands.

ON THE RAINFALL OF CENTRAL AND NORTH WALES.

Reference to the list of stations given in the "*Report of the British Association for* 1865," will show that, prior to 1860 there had, in the tract represented in the accompanying map (*see frontispiece*), only been observations made at four places—viz., Lampeter five years, Rhayader two years, and Llandudno and Gwynnsany one year. In 1862, there were only five returns; in 1863, six; in 1864, there were twelve; in 1865, thirty-five, nineteen being supplied by Captain Mathew, of Wern. In 1866, there were forty; and this year there are about the same number, but more widely distributed.

The great increase due to Captain Mathew's exertions is thus rendered evident; and the results obtained have, we are sure, been such as, to some extent, to compensate him for the trouble and expense of

organizing them. Not that the gallant captain has expected, received, or would accept, repayment even of his outlay; but it must be a source of great satisfaction to him to find that, what he took up simply as a scientific question has already, as is so often eventually the case, borne practical fruit in supplying information as to the rainfall, and therefore available water supply of the Principality, with reference to the Metropolis, to Liverpool, and other places. Thanks to the daily growth of these practical applications of rainfall statistics, we have this year several additional returns from a district previously unexamined; but which having been commenced, will not, I hope, be too abruptly abandoned. These returns are rapidly removing the rainfall of Wales from the uncertainties of conjecture to the rigorous domain of physical facts. Very much has already been ascertained, as the general tables for Wales (Division XI.) abundantly show; but much has yet to be done. Wales, in the matter of rain, has yet her spurs to win—a second Stye, or Seathwaite, or even Langdale, has not yet been found.

No. on Map	Station.	County.	No. on Map	Station.	County.
1	Port Madoc	Carnarvon	33	St. Asaph (Brynbella)	Flint
2	Maentwrog (Caen y coed)	Merioneth	34	Bangor (Llanllechid)	Carnarvon
3	Festiniog (Blaenyddol)	,,	35	Hendre	Merioneth
4	Trawsfynedd	,,	36	Bala (Llanderfel)	,,
5	Beddgelert (Sygun)	Carnarvon	37	Corwen (Rhug)	,,
6	Llangybi (Cefn)	,,	38	Snowdon (Hafod y llan)	Carnarvon
7	Carnarvon (Plas Brereton)	,,	39	Carnarvon (Cochsidia)	,,
8	Llanberis (Glyn Padarn)	,,	40	Upper Clynnog	,,
9	,, (Roy. Vict. Hotel)	,,	41	Aberdeunant	,,
10	,, (Dinorwic Quarries)	,,	42	Langadwaladr	Anglesey
11	Bethesda (Penrhyn Quarries)	,,	43	Snowdon Slate Quarries	Carnarvon
12	,, (Brynderwen)	,,	44	St. Asaph (Llanerch)	Flint
13	Llanllyfni (Cilgwyn)	,,	45	Pwllheli	Carnarvon
14	Bettws y coed	,,	46	Head of Vyrnwy (Blaen y coed)	Montgom.
15	Rhiwbrifdir	Merioneth	47	Llanwyddyn	,,
16	Llanystumdwy (Talarvor)	Carnarvon	48	Dolgelly (Llanelltydd)	Merioneth
17	Pwllheli (Bodfaen)	,,	49	Garthbibio (Lluest-fawr)	Montgom.
18	Clynnog	,,	50	Talyllyn (Bryn yr Eglwys)	Merioneth
19	Conway (Morfa)	,,	51	Towyn	,,
20	Bala	Merioneth	52	Talgarth Hall	,,
21	Dolgelly	,,	53	Machynlleth	Montgom.
22	Aberdaron (Sarn)	Carnarvon	54	Carno (Capel)	,,
23	Menaifron [Carnarvon]	Anglesey	55	Head of Clwyedog	,,
24	Llanfairynghornwy	,,	56	Llanidloes (Broomcliffe)	,,
25	Llanerchymedd (Llandyfrydog)	,,	57	Capel Bangor (Broncastell)	Cardigan
26	Llanfairfechan	Carnarvon	58	,, ,, (Goginan)	,,
27	Bangor	,,	59	Llanidloes (ystrad olwyn fawr)	,,
28	Dolgelly (Brithdin)	Merioneth	60	Llantrisant (Frongoch)	,,
29	Llandudno	Denbigh	61	Logylas	,,
30	Beaumaris (Henllys)	Anglesey	62	Rhayader (Cefnfaes)	Radnor
31	Rhyll	Flint	63	Lampeter	Cardigan
32	Denbigh (Plas Clough)	Denbigh			

ORIGIN, PROGRESS, AND PRESENT STATE OF OUR KNOWLEDGE OF THE RAINFALL IN THE LAKE DISTRICT.

So far as we at present know, the two earliest rainfall observers in the British Isles resided in districts of which the mean annual fall is widely different. The one, Mr. Townley, found the mean amount to be about 41 in. at his house in Lancashire; while the Rev. W. Dereham found the fall near Romford, Essex, to be only 20 in.* Thus, in 1698, were the pioneers of rainfall investigations brought face to face with the fact that the rainfall in one part of England was double that in another. A century later, Dr. Dalton showed that the Upminster fall was *trebled* at Kendal and Keswick. Thirty years later, in 1839, Esthwaite Lodge, on the banks of Windermere, was found to have a mean fall nearly *fourfold* that of Upminster. A fall of 100 in., or *five times* the Upminster fall, was recorded in 1845, at Wastdale Head; and 120 inches, or *six times* the Upminster fall at Gatesgarth, Grasmere, and Langdale; and 150 inches, or *seven* times the Upminster fall at Seathwaite. In 1851, Dr. Miller's gauge at the Stye collected 169·62 in. (very nearly the true mean at that remarkably wet spot), being *eight times* the Upminster fall. In the year 1866 (a wet year), 224 in. were collected by Mr. Fletcher's gauge in nearly the same position, being *eleven times* the Upminster fall.

Now, all the records of 100 in. and upwards are from a small circle of less than three miles radius, and having Stye Head Tarn for its centre. But, though perhaps this embraces the finest scenery, and heaviest rainfall in the whole Lake district, it seemed of the highest interest to extend our sphere of observation, and ascertain the fall in the wide tract (about 120 square miles) known as the English Lakes. To this end I devoted the autumn of 1866; and the results I have now the pleasure of submitting, as a further contribution to the knowledge of the rainfall of that important district. A contribution only, because we still know nothing of the fall in the district west of Coniston Waterhead (round Coniston Old Man), near Brother's Water, or at the head of the river Sprint. There was, twelvemonths

* 23 in. if corrected for the height of his gauge above the ground; which is within an inch of the result of modern observations; thus the records of the 17th and 19th centuries are in perfect accordance.

since, a proposal for supplying Carlisle with water from the river Glenderamakin, which is principally fed by Scales Tarn, at the N.E. of Saddleback. If this proposal is entertained, we may hope to learn something also of the fall on that northern out-post of the district. Let me, however, in the first place, briefly epitomize the labours of my precursors and present coadjutors.

John Gough, Esq., started the first gauge in the Lake district, viz., one at Kendal, in 1787.

John Dalton, Esq., D.C.L., F.R.S., &c., registered the rain at Kendal, and induced Mr. Crosthwaite to do the same at Keswick in 1788 and following years, and published several notes on the subject.

Samuel Marshall, Esq., of Kendal, the observer whose record is the earliest of all living men, the register going back to 1809, and the observations since 1822 being made by himself. To him we are also indebted for starting some of the most important gauges in the district; and though last, not least, for publishing yearly summaries of his observations, which tended to keep alive the interest in the subject in years wherein its *practical* importance was unknown. I think the value of these yearly abstracts may be advantageously illustrated by a quotation from that on the year 1840:—

"It is very gratifying to observe the increasing interest which has lately been manifested by several scientific gentlemen in this county, but especially in this neighbourhood, respecting the meteorology of Westmoreland. Their labours cannot fail, if persevered in, to render essential service to this obscure branch of science. I am disposed to say obscure, because the general laws which regulate the meteorology of any district are yet undiscovered, for want of persevering and continuous observation for a series of years. It has long been thought that this district had contributed an ample portion of information by the labours of Dr. Dalton, John Gough, &c.; but even they, I am persuaded, capacious as were their views, and intimate as they were with this locality, never anticipated such results as we now have from observations made in the mountainous district north of us. For instance, the quantity of rain measured at Esthwaite, a distance of twelve miles from Kendal, for the last four years, exceeds that of this place by very nearly one-half, the averages for that period being at Esthwaite 73·066, and at Kendal 50·081 in.: the quantity for 1840 at Esthwaite being 66·362. In the interval between Esthwaite and Kendal, gauges have been erected during this year, and though, from the shortness of the period they have been in operation, no important results can yet with propriety be deduced, it is interesting to observe that the one at Bowness, which has been longest in operation, from the beginning of April, which is kept by a gentleman in whose attention and correctness I have implicit confidence, shows a medium quantity between those of Kendal and Esthwaite. If we take the last six months of the year, we shall find that at Kendal the quantity registered was 26·821 in.; at Bowness, about nine miles further north, the quantity was 31·454; at Elleray, a short distance from Bowness. 36·196; and at Esthwaite, about twelve miles W.N.W. from Kendal, 38·523 in."

James Garth Marshall, Esq., of Coniston Hall, has devoted considerable attention to the rainfall of the district, having at one time a number of gauges in various parts, including one near the summit of Helvellyn. To him and his brothers—W. Marshall, Esq., M.P., of Patterdale, Henry Calder Marshall, Esq. of Keswick, and Arthur Marshall, Esq. of Hallsteads—we are very much indebted for returns of considerable importance.

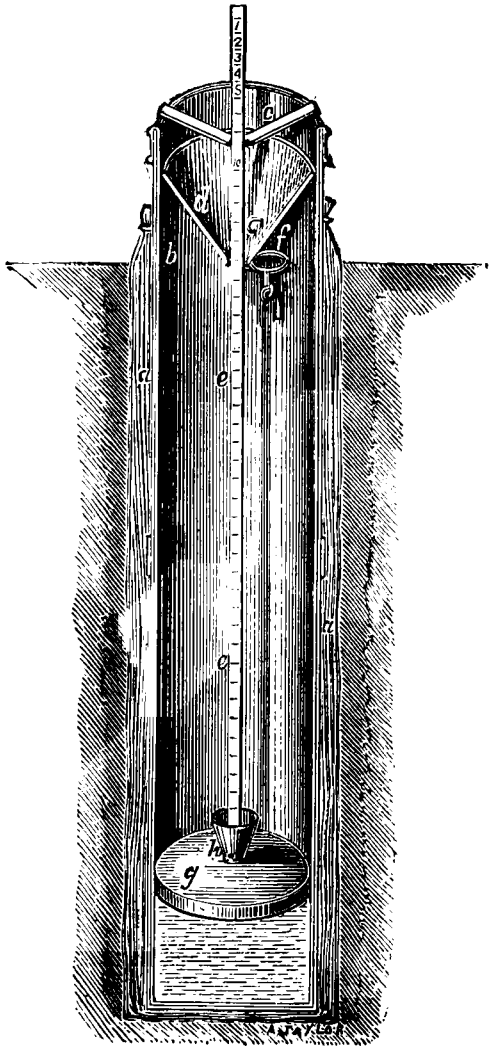
John Fletcher Miller, Esq., F.R.S., Ph.D., A.I.C.E., &c. While others had observed on the confines of the mountain tracts, Dr. Miller plunged into their midst, and planted his gauges alike in valley and on mountain-top; wherever he thought it desirable to have observations made, *there* a gauge was planted, and regularly observed. Dr. Miller commenced operations by starting a gauge at Ennerdale Lake in November, 1843, and "yearly increased and varied his stations until the fall in the valleys of Wastdale, and Borrowdale, and 'Seathwaite,' and 'the Stye,' became, with meteorologists, as well known as London or Dundee;" the principal results of his observations were communicated to the Royal Society from year to year until they were discontinued, in 1853, only about two years before Dr. Miller's death, which occurred in July, 1856.

Mr. John Dixon, the agent for the celebrated Borrowdale Plumbago Mine, and resident at Seathwaite, (who died at a ripe and honoured old age, in 1866,) together with his widow and daughter, claim a place among the rain-gauge celebrities of the Lake district—not merely because their garden is one of the wettest spots known, not merely because it was only through him that *the* wettest spot, "the Stye," was discovered, not merely because they are ever ready to help so far as is in their power; but because their record, now extending over *twenty-three* years without a break, is, as will presently be seen, of immense importance in the interpretation of other returns in the vicinity. That record was continued by them after Dr. Miller's death, when all the other gauges were abandoned, and, without the slightest encouragement from any one, they quietly added, year by year, to their register, until at length the subject was again taken up, and now some of the most important questions of the day have been influenced by the work of these worthy cottagers.

Isaac Fletcher, Esq., F.R.S., &c., of Tarnbank, re-organized these stations in the beginning of 1864, provided them with new gauges, and made arrangements for their careful registration, which have proved perfectly efficient, not the slightest interruption having occurred.

In the autumn of 1866, I resolved on trying whether it was not practicable largely to extend the area of investigation; but the first

thing to be done was to decide on a gauge which should fulfil the following conditions :—1, Be easy to read; 2, resist frost; 3, catch some snow; and 4, not be likely to get out of order. Eventually Mr. Casella was instructed to make thirteen gauges, of which the following woodcut has already appeared elsewhere; but the reproduction of which will render the description more intelligible.



The gauge adopted was 4 feet long, and 8 inches in diameter; the can (*b*) is double, and of very stout zinc; the outer case was wrapped in straw (*a*), cased in canvass saturated with gas tar, and buried 3 feet deep in the earth, a quantity of tar being poured into the hole as it was filled up, in order, as far as possible, to preserve the canvass, and keep the straw dry. By these measures, and the addition of a little salt to the rain, frost was entirely avoided. The measuring rod (*e*) is detached, and dropped into the cup (*h*) when an observation has to be made, the reading being shown by the loose cross piece (*c*), which cuts the rod at the true reading, which is shown at 8½ in. The funnel (*d*) is also moveable, and the inner cylinder being lifted out by the handle (*f*), the water is readily emptied.

The disposal of these gauges was as follows :—One (No. 11 on map page 20) was placed in the garden of Mrs. Dixon's house, at Seathwaite, about 1 foot 6 in. from one of Mr. Fletcher's mountain gauges, and 3 ft. from the old gauge erected by the late Dr. Miller, in 1844. All three are regularly observed, and the records for 1867 will be found on page 42.

No. 13. Watendlath is in a garden at the extreme south of the hamlet, free from all buildings, shrubs, &c, about 20 ft. above Watendlath Tarn, and 100 yards E. of it. The fells rise rather abruptly E. of the gauge.

No. 18. Skiddaw. This is on the S.W. slope of Skiddaw, at about half way up, and on a flat tract of some size.

No. 20. Wythburn. In the garden of the parsonage, and about 40 ft. N. of it; a 5 ft. wall is about 15 ft. off, in W, and N., and there are no trees to affect the record. This gauge is at the point where the Wythburn Valley runs into that of Thirlmere.

No. 21. Helvellyn, Birkside. On a small plateau about 1,200 ft. above, and half-a-mile E. of Gauge No. 20. It is 30 feet W. of a small crag (20 ft. high), and perfectly open to all points, from S.E. by W. to N.E.

No. 28. Matterdale. On a gentle slope of the common towards the road from the north end of the vale of Saint John to High Row, Dockray, and about one mile due north of Dowthwaite Head.

No. 29. Gowbarrow. On the west slope of the fell, near its lower edge, about one mile from Dockray, and three miles E.S.E. of gauge No. 28.

Nos. 30, 31, and 32. Greenside, Stang End, and Greenside Mills. These returns have, most unfortunately, been stopped by the removal of the observer. The gauges were placed in the Glenridding gorge above Greenside Mills—one at the bottom at 1,000 ft., one at 1,550 ft., and one at 2,000 ft.

No. 34. Kirkstone Pass. In the garden, 40 ft. south of the "Traveller's Rest" Inn (the highest inhabited house in England), ground sloping gently to N.W.

No. 39. Swarth Fell On the N.W. side of the north end of the fell, about half way between How Town and Pooley Bridge.

No. 40. Mardale Green. In a field about 50 yards S.S.E. of the "Dun Bull" Inn, south end of Haweswater, and about 100 ft. above the lake. Hills rise abruptly S.E. of this gauge.

No. 41. Measandbecks. On the fell, 500 ft. above, and half-a-mile W. of Measandbeck Hall, and the middle of Haweswater.

No. 42. Wet Sleddale. The most easterly of the new gauges, being 18 miles E. of Seathwaite; it is placed at the head of Wet Sleddale, 500 yards S.S.W. of Seat Robert, and 200 ft. below it.

No. A. Easdale Tarn, near Grasmere, should perhaps have been numbered 22; but it was erected last, and so did not have a proper number assigned to it. It is on a small plateau on the north side of the Tarn, and about 300 ft. above it.

We are indebted to Mr. Wheatley Balme, of High Close, Loughrigg, for the returns from gauges 19, 23, and 24, as well as for those from number 22, his own residence, at High Close. The three first-mentioned gauges are identical with those planted by myself. No. 19

is at the head of Langdale, nearly in the bottom of the valley; No. 23 at the foot of Loughrigg, near Elterwater; and No. 24 on the top of Loughrigg, three-quarters of a mile E.N.E of No. 23,

Lastly, there are, and have been, at intervals, a large number of gauges at the principal residences in the district. Except, therefore, that there are still some blank spaces too large for so important a locality, we may congratulate ourselves on having infinitely better data than has ever been the case before. Thanks to the liberal help of Mr. Fletcher, and one or two other friends, I hope to keep these new gauges at work for a few years more; but, in the interim, it is of high interest to see the results already ascertained—and which I would dedicate to one (need I say it was not Mr. Fletcher?) who told me that he and Dr. Miller had found out all there was to find. Indeed! I wish he would tell me (before reading the rest of this article) the mean fall on Matterdale Common, at the head of Haweswater, or in Sleddale, within 20 inches of the truth.

Approximate Determination of the Mean Annual Fall at various Stations in the Lake District.

As years roll on, and the laws of the distribution of rain are gradually developed, the fallacy of practices of the wisest of our precursors is rendered evident to all. Without quoting such preposterous cases as that of tabulating the fall in *one* year as the mean rainfall of the place of observation, in which case an error of 50 per cent. may occur,* many have thought that five or six years would give a pretty fair mean, especially if two or three stations were taken together. The following table shows that the six years, 1853 to 1858, were more than 20 per cent. below the average of 22 years, and that the five years, 1859-1863, were nearly 20 per cent. above it. Thus we have two periods of six, and five years respectively, in one of which the fall is half as large again as in the other. Thus it becomes obvious that the mean fall can be ascertained only by two methods: either by long-continued observation at the place, or by reference to some proximate long-established gauge. This is the only method by which the observations made in the Lake district can be reduced to their true values. Most fortunately, the registers at The Howe, Troutbeck, at Scathwaite, and at Keswick, extend from the first year of Dr. Miller's work to the present time; they have therefore been employed as standards of reference for all the gauges, Dr. Miller's, Mr. Fletcher's, and my own :—

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* For example, the fall at Troutbeck, in 1861, was 116 in., and in 1855 it was 47½ in.; in either case it would have been more than 30 in. in error.

Determination of the ratio of the rainfall in each of 22 *years to the mean of the whole period* 1845 *to* 1866.

Year.	Rainfall in each year.			Ratio at each Station.			Mean Ratio.
	The Howe, Troutbeck, Winderm're	Seathwaite, Borrowdale.	Keswick.	The Howe, Troutbeck.	Seathwaite, Borrowdale.	Keswick.	
	in.	in.	in.				
1845	76·30	151·87	62·20	96	108	106	103
1846	77·71	143·51	67·68	97	103	116	105
1847	78·00	129·24	58·28	98	92	100	97
1848	91·34	160·89	66·41	114	115	113	114
1849	75·42	125·47	48·80	94	90	83	89
1850	79·81	143·96	59·53	100	103	102	102
1851	80·77	139·60	62·34	101	100	106	102
1852	115·62	156·74	79·97	145	112	137	131
1853	65·97	113·69	50·45	83	81	86	83
1854	65·95	143·48	46·82	83	103	80	89
1855	47·54	88·31	37·40	60	63	64	62
1856	55·28	105·52	47·55	69	75	81	75
1857	55·30	116·60	48·88	69	83	84	79
1858	60·07	114·61	50·27	75	82	86	81
1859	94·95	147·29	66·89	119	105	114	113
1860	102·58	142·20	54·17	129	102	93	108
1861	116·26	182·58	74·42	146	130	127	134
1862	94·27	170·03	61·37	118	121	105	115
1863	84·97	173·84	71·54	106	124	122	117
1864	75·74	134·67	52·68	95	84	90	90
1865	64·05	117·49	49·18	80	96	84	87
1866	98·69	179·12	70·81	124	128	121	124
Mean..	79·85	140·03	58·53	100	100	100	100
1867	77·83	133·31	52·14	97	95	89	94

I do not intend, on the present occasion, to print the falls in the whole 23 years at all stations, but simply the results obtained by means of the ratios in the last column. When the new gauges have been at work for a year or two, we may perhaps be able to discontinue the more difficultly accessible gauges, and review in detail the accuracy, or otherwise, of our present deductions.

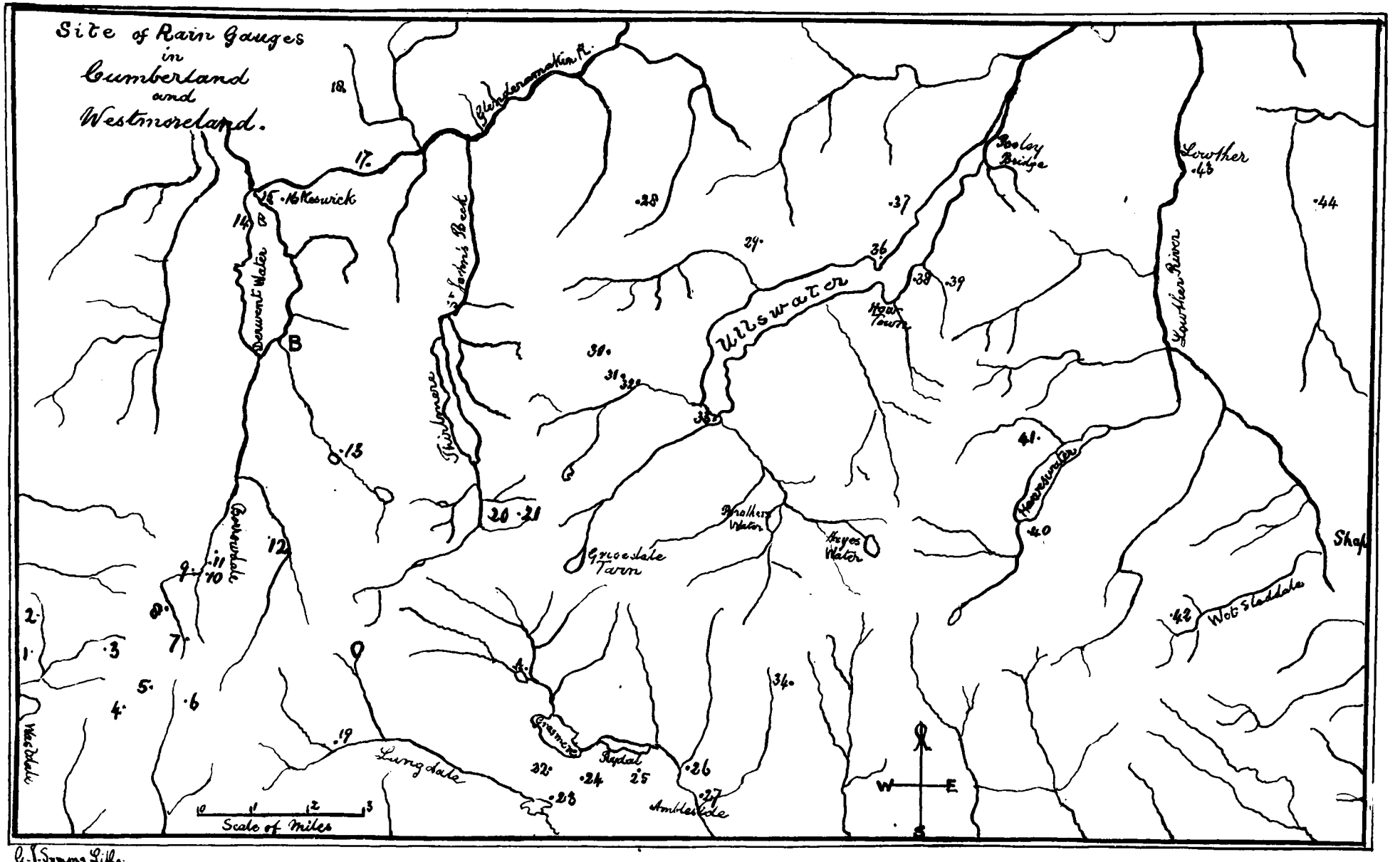
It may be well to give in detail a specimen of the mode by which the approximate means have been obtained. The fall at Wastdale Head was as follows .—

	in.		in.		in.	
1845 ...	108·55	1848 ...	115·32	1851 ...	97·94	Mean of
1846 ...	105·93	1849 ...	107·22	1852 ...	109·58	these 9 years,
1847 ...	96·34	1850 ...	108·76	1853 ...	83·39	103·67

By reference to the last column of the ratio table, it will be found that the mean ratio of those nine years was 102·9 ; that is to say, the rainfall in those years was 3 per cent. above the average. It only remains, therefore, to divide the mean observed fall by the mean ratio to deduce the approximate true mean, *e.g.* 103·67÷1·029=100 inches.

Rain Gauges in the Lake District and their Results.

No. on Map.	Station.	Authority.	No. of Years.	Altitude.	Approximate Mean Fall.
				ft.	in.
1	Wastdale Head.....	Dr. Miller, F.R.S.	9	247	100
,,	,, ,, ...	I. Fletcher, Esq., F.R.S.	4	,,	90
2	Mosedale	,, ,, ...	2	624	80
3	Brant Rigg	Dr. Miller, F.R.S.	6	695	85
,,	,, ,, ...	I. Fletcher, Esq., F.R.S.	4	,,	78
4	Scawfell Pike	Dr. Miller, F.R.S.	3	3200	73
,,	,, ,, ...	I. Fletcher, Esq., F.R.S.	4	,,	63
5	Great End.....	,, ,, ...	3	2982	69
6	Esk Hause	,, ,, ...	3	2550	81
7	Sprinkling Tarn	,, ,, ...	4	1985	121
8	Styehead Tarn	Dr. Miller, F.R.S.	6	1472	105
,,	,, ,, ...	I. Fletcher, Esq., F.R.S.	4	,,	119
9	Taylor's Gill.....	,, ,, ...	1	1077	174
10	The Stye	Mr. Dixon	7	948	152
,,	,, ,, ...	I. Fletcher, Esq., F.R.S.	3	1077	182
11	Seathwaite	Mr. Dixon	22	422	140
,,	,, (Fletcher's 4in.)	Mrs. Dixon	3	,,	127
,,	,, (Symons' 8 in.)	,, ,, ...	1	,,	130
12	Stonethwaite.....	Dr. Miller, F.R.S.	7	330	108
,,	,, ...	I. Fletcher, Esq., F.R.S.	4	,,	103
13	Watendlath	G. J. Symons, Esq.....	1	867	83
14	Derwent Island	H. C. Marshall, Esq. ...	3	240	49
15	Crow Park	,, ,, ,, ...	3	260	55
16	Keswick	Mr. J. F. Crosthwaite...	22	270	59
17	Greta Bank	J. J. Spedding, Esq. ...	2	400	55
18	Skiddaw	G. J. Symons, Esq.....	1	1677	60
19	Langdale	Dr. Miller, F.R.S.	8	250	118
,,	,, ...	E. B. W. Balme, Esq....	1	380	107
20	Wythburn	Rev. Basil Lawson	1	574	88
21	Helvellyn, Birkside...	G. J. Symons, Esq.....	1	1800	92
22	High Close	E. B. W. Balme, Esq....	5	553	77
23	Elterwater.....	,, ,, ,, ...	1	200	84
24	Loughrigg Fell	,, ,, ,, ...	1	1050	69
25	Rydal	Mr. Jones.....	1	185	76
26	Lesketh Howe	Dr. Davy, F.R.S.	20	200	78
27	Low Nook	J. C. Wilson, Esq.	8	170	75
28	Matterdale	G. J. Symons, Esq.....	1	1400	87
29	Gowbarrow	,, ,, ,, ...	1	1100	77
30	Greenside	,, ,, ,, ...	...	2000	Imp.
31	Stang End	W. Marshall, Esq., M.P.	1	1550	80
32	Greenside Mills	G. J. Symons, Esq.....	...	1000	Imp.
33	Patterdale Hall	W. Marshall, Esq., M.P.	7	500	75
34	Kirkstone Pass.....	G. J. Symons, Esq.....	1	1500	88
35	The Howe, Troutbeck	Admiral Wilson	22	470	80
36	Hallsteads.....	A. Marshall, Esq.....	18	480	52
37	Watermillock	W. Marshall, Esq., M.P.	8	720	54
38	Sharrow Bay.....	A. Parkin, Esq.	1	500	35
39	Swarth Fell	G. J. Symons, Esq.....	1	1000	46
40	Mardale Green.....	,, ,, ,, ...	1	800	90
41	Measand Becks	,, ,, ,, ...	1	1200	54
42	Wet Sleddale	,, ,, ,, ...	1	1500	93
43	Lowther Castle	J. Parkes, Esq., C.E. ...	3	840	44
44	Great Strickland	H. H. Plumer, Esq. ...	3	647	38
A	Easdale Tarn	G. J. Symons, Esq.....	1	1175	97
B	Barrow House	S. Z. Langton, Esq. ...	1	270	66



G. J. Symons, Lith.

One of Dr. Miller's principal deductions was, that the amount collected increased with the elevation up to 2,000 ft., and then diminished. Grouping the whole of the returns according to altitude, we get :—

Below 500 ft.,	16	stations,	mean fall	87	inches.
500 to 1000 ft.,	10	,,	,,	79	,,
1000 to 1500 ft.,	10	,,	,,	100	,,
1500 to 2000 ft.,	4	,,	,,	92	,,
2000 to 2500 ft.,	no	,,	... ..	...	...
2500 to 3000 ft.,	2	,,	mean fall	75	inches.
3000 to 3500 ft.,	2	,,	,,	68	,,

This would indicate that the maximum occurs at nearer 1,000 ft. than 2,000 ft.; and the same indication results from grouping the stations having 100 in. and upwards, according to their amounts. There are 14 such stations; their mean fall is 128 in., and mean altitude 785 ft. There are 5 stations having more than 128 in., and their mean altitude is 789 ft; and there are 9 having between 100 in. and 128 in., and their mean altitude is 782 ft., thus showing how slight is the effect of altitude. Lastly, the wettest spot known is at 1,077 ft., the next wettest at 422 ft., and there is only one station above 1,500 ft. which has a fall of even 100 in.

The slight effect of altitude is evident all through the table—for instance, Skiddaw (18) is 1,400 ft. above Keswick (17), yet the amounts only differ by one inch. Again, Wythburn (20), and Birkside (21), differ by 1,200 ft., and in amount only by 4 in. Sometimes the amount is largely in excess at the lower station; as with Elterwater (23), at the foot of Loughrigg and Loughrigg Fell-top (24), a difference of 850 ft., and a deficiency of 15 in. at the greater elevation.

Concerning the distribution of rain in the district, the following appear indisputable facts :—

1. That there are various spots in the district at which the true mean annual rainfall is above 100 in.

2. That true mean falls of 125 in. and upwards are at present only known to occur at the head of Borrowdale.

3. That in the greater part of the district the fall is 80 in. or 90 in., and that these heavy falls occur almost as far to the east as Shap; but that the amount in the north-eastern parts decreases with great rapidity, the clouds having been previously condensed by contact with the mountain-tops, until a few miles N.E. of Penrith is probably almost as dry as Bedford.

ON HOW MANY DAYS IN THE YEAR WILL HALF-AN-INCH OF RAIN FALL?

A VERY few years since the propounder of such a question as the above would have been thought most unreasonable, and he who spent his time in attempting to answer it would have been set down as an ingenious trifler. *Cui bono* may be chalked on the rain gauges; but, he who writes it now, proclaims only his own ignorance of the progress of sanitary, engineering, and agricultural science. Just as with luminous meteors, observers recorded the whence and whither of those momentary appearances, unconscious of their nature, and little dreaming that those very observations would lead to such important astronomical discoveries as they have; so there were many who thought —if we knew the total yearly rainfall, we should need no more, and that to collect a mass of *daily* records was simply gathering that which was indigestible and useless. But, as has often been said: a fact in science once clearly ascertained, is almost always productive of good, sooner or later; and so it seems to be with these daily rain registers.

Without entering into sewage questions in general, it is evident to all, that the effectual removal of rain water from a city is a most important consideration in all drainage questions. For many of these it suffices to know the probable maximum fall in certain limited times. This information has, to a considerable extent, been supplied in previous publications, under the heading "Maximum falls;" but it may be well to repeat that the result has been to establish the following rules:—

1. The greatest per-centages are at dry stations.
2. The greatest daily falls are at wet stations, but
3. The wet stations seldom have more than 5 per cent. of their yearly fall in 24 hours, whereas
4. The dry stations often have 10 per cent., and sometimes 13, 14, or 15 per cent.

5. The final result, therefore, is "that though in point of quantity the western stations maintain their excess as well in individual falls as in the yearly totals, the heavy falls *there* are relatively hardly half so large as at the eastern stations. In fact, with two or three exceptions, the classification resulting from these falls is a perfect guide to the geographical position of the stations; or, to put it in the plainest possible language, the rainfall at the western stations is more uniform in its distribution than at the eastern ones, where the fall is, so to speak, more spasmodic."

The paragraph quoted in section five was part of the published note on the result of the examination of the returns for 1864; those for 1865 and 1866 have so strikingly confirmed it, that I reprinted it verbatim in *British Rainfall*, 1866, as part of the commentary on the maximum falls of that year.

Hence we shall, apparently, soon obtain the probable maximum fall by a simple calculation from the mean annual fall. The rule seems to be that with a mean fall of 20 in., 16 per cent. thereof (3·20 in.) may fall in one day, and that for each additional inch of mean fall up to 60 in., the per-centage must be reduced by 0·25 per cent. For example, if the mean fall is 36 inches ($36-20 = 16 \times 0{\cdot}25 = 4$), then $16-4 = 12$ per cent., would be the per-centage, and ($36 \div 100 \times 12 =$) 4·32 in. is the probable maximum. I think it likely this rule may require modification; but it is closer than the generality of observations will give, and, so far as I know, the only rule yet proposed for the purpose.

It may be well to point out a result of this rule, which is quite supported by facts, and rather interesting; it is this—that the probable maximum in 24 hours is almost identical at all stations having from 25 to 70 inches of rain per annum. At the wettest or driest a fall of 4 inches in 24 hours will occur sooner or later. Above 70 inches, the maximum rises, till with 180 inches of mean annual fall 11 inches may fall in one day. Mr. Fletcher has recorded 9 inches in one day.

This, however, does not answer the question at the head of this article; and when it was put to me by such an authority as Mr. Menzies, I felt it necessary to endeavour to answer it. Hence the following tables :—

ANALYSIS OF DAILY RAIN REGISTERS.

1865.

Total Fall.	Stations.	Altitude.	NUMBER OF DAYS IN 1865 ON WHICH THE FALL OF RAIN WAS																				Total Days.
			Under ·10	·10 to ·20	·20 to ·30	·30 to ·40	·40 to ·50	·50 to ·60	·60 to ·70	·70 to ·80	·80 to ·90	·90 to 1·00	1·00 to 1·10	1·10 to 1·20	1·20 to 1·30	1·30 to 1·40	1·40 to 1·50	1·50 to 2·00	2·00 to 2·50	2·50 to 3·00	3·00 to 4·00	4·00 to 5·00	5·00 to 6·00	
22·63	Whitby	184	78	37	17	7	6	3	3	1	...	1	...	...	...	...	...	...	...	...	...	...	...	153
23·44	Filey	183	104	27	12	12	5	7	2	1	1	1	...	...	...	...	...	...	...	...	...	...	...	172
24·12	Henley-in-Arden	300	54	28	19	10	6	2	2	2	...	1	...	...	1	...	...	1	...	...	...	...	...	126
26·30	Spilsby	80	84	28	19	5	5	6	1	...	...	2	1	1	...	1	1	...	...	...	...	...	...	154
27·46	Wantage	185	70	29	19	9	6	5	...	2	...	1	1	1	...	1	...	1	...	...	...	...	...	145
27·97	Lutterworth	..	40	32	20	10	3	2	2	1	1	1	2	...	1	2	...	1	...	...	...	...	...	118
29·53	Watton	...	82	34	18	10	4	7	4	...	1	...	...	1	...	...	...	2	...	...	...	...	...	163
29·80	Acol	60	30	22	23	7	4	7	4	4	1	2	...	...	...	...	...	2	...	...	...	...	...	106
30·08	Owston	460	93	34	23	10	1	4	1	1	...	2	2	1	1	..	...	2	...	...	...	...	...	175
31·71	Logierait	250	62	26	17	8	4	4	2	5	1	2	1	...	1	1	1	1	...	...	...	...	...	136
31·97	Winchmore Hill	...	64	28	17	9	7	6	3	2	4	1	...	3	1	...	...	...	...	...	...	...	...	145
32·55	Presteign	550	65	34	21	15	6	8	6	2	2	...	1	...	...	...	...	...	...	...	...	...	...	160
32·61	Taunton	...	62	27	28	7	8	5	5	4	...	...	1	1	...	...	...	1	...	...	...	...	...	149
34·16	Southampton	100	71	25	10	15	5	2	9	6	3	2	2	...	...	...	...	...	...	...	...	...	...	150
34·23	Marlborough	456	75	28	24	9	13	7	2	2	3	...	...	1	...	...	...	1	...	...	...	...	...	165
34·53	Aberystwith	12	68	36	26	20	12	8	1	2	2	...	...	...	...	...	...	...	...	...	...	...	...	175
36·20	Rolvenden	...	71	30	20	11	2	8	6	1	3	1	1	2	1	1	...	1	...	...	...	...	...	159
38·30	Lochbroom	47	97	59	22	15	10	9	4	1	2	1	...	1	...	...	...	...	...	...	...	...	...	221
38·75	North Balfern	50	93	30	25	21	7	10	3	2	4	1	2	...	1	...	...	...	...	...	...	...	...	199
41·37	Whitbeck	...	62	38	27	21	9	2	7	1	3	...	...	1	1	...	1	...	2	...	...	...	...	175
42·97	Bala	540	49	30	16	20	16	6	6	5	4	2	...	1	...	...	...	...	1	...	...	...	...	156
45·87	Torquay	200	85	30	12	15	12	9	11	3	3	...	1	3	...	...	...	1	1	...	...	...	...	186
52·42	Clunes	...	58	42	23	17	9	8	5	8	6	3	2	...	1	1	1	1	...	...	...	...	...	185
55·39	Applecross	50	35	34	24	21	17	8	8	11	3	1	2	1	1	2	...	1	...	...	...	...	...	169

ANALYSIS OF DAILY RAIN REGISTERS.

1866.

Total Fall.	Stations.	Altitude.	NUMBER OF DAYS IN 1866 ON WHICH THE FALL OF RAIN WAS																				Total Days.
			Under ·10	·10 to ·20	·20 to ·30	·30 to ·40	·40 to ·50	·50 to ·60	·60 to ·70	·70 to ·80	·80 to ·90	·90 to 1·00	1·00 to 1·10	1·10 to 1·20	1·20 to 1·30	1·30 to 1·40	1·40 to 1·50	1·50 to 2·00	2·00 to 2·50	2·50 to 3·00	3·00 to 4·00	4·00 to 5·00	5·00 to 6·00	6·00 to 7·00	
23·44	Fearn	48	109	48	17	6	4	4	2	...	1	1	...	...	...	...	...	...	...	...	...	...	...	192
26·31	Filey Reservoir	183	146	32	14	3	6	2	4	1	1	1	...	...	...	...	...	2	...	...	...	...	...	212
28·05	Monkstown	...	137	38	19	8	7	2	2	1	1	...	1	2	...	...	...	...	...	...	...	...	...	218
28·30	Whitby	184	121	42	15	6	9	3	2	3	...	1	...	...	...	...	...	...	1	...	...	...	...	203
28·46	Acol, Thanet	60	34	34	19	14	8	3	4	4	2	...	...	...	...	...	...	...	...	...	...	...	..	122
29·01	Heydon	440	125	37	27	11	4	7	...	2	2	...	...	...	1	...	...	...	...	...	...	...	...	216
29·90	Rugby	384	97	42	18	16	5	...	1	...	3	...	...	...	...	...	2	1	...	...	...	...	...	185
30·09	Wantage	185	77	38	25	14	7	8	1	3	1	...	...	...	...	...	...	...	...	..	...	...	...	174
31·92	Tytherton	150	116	30	26	19	10	1	4	3	...	...	1	...	...	...	...	...	...	...	...	...	...	210
32·24	Alderney	48	93	46	22	13	6	7	1	2	2	2	...	...	...	...	...	...	...	...	...	...	...	194
32·89	Owston	460	108	50	25	15	7	4	2	...	...	...	2	...	1	...	...	1	...	...	...	...	...	215
36·10	Wallington	398	118	39	32	12	12	4	1	3	2	1	...	...	1	...	...	...	...	...	...	...	...	225
36·68	New Byth	391	78	53	26	20	12	6	4	...	1	...	...	...	...	...	...	...	..	...	...	...	...	200
37·30	Budleigh Salterton	16	82	48	20	15	8	5	4	3	2	...	2	...	...	...	...	...	1	...	...	...	...	190
38·05	Marlborough	456	124	43	24	14	12	6	5	2	3	1	...	...	...	...	...	...	...	...	...	...	...	234
39·03	Presteign	550	112	54	23	19	11	6	5	1	1	1	...	1	1	...	...	...	..	...	...	...	...	235
39·73	Bristol	100	90	47	23	18	9	5	4	4	1	1	...	1	1	1	...	...	...	...	...	...	...	205
41·93	Pembrey	7	100	44	28	11	15	6	8	2	1	2	...	...	...	...	1	...	...	...	...	...	...	220
43·17	Manchester	106	84	46	29	12	15	5	3	3	1	1	3	1	1	...	...	1	...	...	...	...	...	205
46·59	Laggan	1000	76	39	31	21	14	11	11	1	2	...	...	1	...	1	...	...	...	...	...	...	...	208
49·87	Whitbeck	...	72	42	30	20	14	9	4	4	3	...	2	3	...	...	...	1	...	...	...	...	...	204
51·59	Galway	25	103	49	40	30	15	9	7	3	1	1	...	...	...	...	...	...	...	...	...	...	...	258
179·12	Seathwaite	422	40	34	16	21	13	9	8	14	9	11	9	5	5	5	2	10	13	4	4	...	...	2	234

ANALYSIS OF DAILY RAIN REGISTERS.

1867.

Total Fall.	Stations.	Altitude.	NUMBER OF DAYS IN 1867 ON WHICH THE FALL OF RAIN WAS																			Total Days.
			Under ·10	·10 to ·20	·20 to ·30	·30 to ·40	·40 to ·50	·50 to ·60	·60 to ·70	·70 to ·80	·80 to ·90	·90 to 1·00	1·00 to 1·10	1·10 to 1·20	1·20 to 1·30	1·30 to 1·40	1·40 to 1·50	1·50 to 2·00	2·00 to 2·50	2·50 to 3·00	3·00 to 4·00	4·00 to 5·00	5·00 to 6·00	
21·32	Shoeburyness	12	65	23	14	9	6	1	4	...	1	...	...	...	1	...	1	...	...	...	...	...	...	125
23·75	Cookham.....	70	73	39	18	9	3	5	...	2	...	1	...	...	1	...	...	...	...	...	...	...	...	151
24·51	Goudhurst	490	87	33	23	10	5	4	...	2	1	1	...	...	...	...	...	...	...	...	...	...	...	166
24·92	Ripon	116	102	28	17	13	5	2	1	2	1	2	1	...	...	...	...	...	...	...	...	...	...	174
25·02	Whitby	184	107	45	16	4	3	3	2	4	...	1	...	1	...	...	...	...	..	...	..	...	...	186
26·01	Strathfield Turgiss	209	93	29	20	5	7	7	2	2	1	...	1	1	...	...	...	...	...	...	...	...	...	168
26·42	Banbury	345	109	34	18	7	5	4	2	3	2	...	...	...	...	1	...	...	...	...	...	...	...	186
27·07	Holloway	140	102	33	15	7	11	3	4	...	1	...	...	...	1	...	...	1	...	...	...	...	...	178
27·16	Swaffham	160	87	36	20	12	4	...	2	1	2	1	2	...	...	...	...	1	...	...	...	...	...	168
27·27	Culford	...	58	40	18	7	3	4	2	3	2	1	...	1	...	...	...	...	1	...	...	...	...	140
28·13	Tytherton Lucas..	150	102	31	23	13	5	5	3	1	1	...	...	1	1	...	...	...	...	...	...	...	...	186
29·03	Wallington.....	399	112	42	21	7	5	5	1	4	1	1	...	1	...	...	...	...	...	...	...	...	...	200
29·51	Rugby	384	82	33	17	11	6	...	6	...	...	1	...	...	...	...	...	2	1	...	...	...	...	159
31·15	Cranbrook	352	140	36	25	8	7	8	2	2	3	...	1	...	..	...	..	...	...	...	...	...	...	232
31·86	Wolsingham	927	97	35	21	17	7	5	5	1	...	2	1	...	...	...	...	...	...	...	...	..	...	191
33·04	Marlborough	456	104	29	23	15	10	5	4	3	...	1	1	...	...	...	...	..	...	...	...	...	...	195
33·59	Presteign..... ..	550	91	45	22	18	6	4	6	3	2	...	...	...	...	...	...	...	...	...	...	...	...	197
36·10	Tintern	16	44	36	27	9	9	9	5	2	6	...	1	...	...	...	...	...	...	...	...	...	...	148
37·50	Leochel Cushnie..	882	71	55	19	15	7	7	6	3	1	...	...	1	1	..	1	...	...	...	...	...	...	187
39·76	Ballymoney	170	116	41	31	19	11	6	1	1	2	1	...	1	...	...	...	1	...	...	...	...	...	221
39·86	Laggan	1000	100	56	34	10	10	8	5	1	...	1	...	2	...	1	...	...	...	...	...	...	...	228
45·71	New Galloway ...	200	78	35	31	15	9	6	5	5	3	3	4	1	...	...	...	...	...	...	...	...	...	195
50·32	Loch Broom	48	103	35	42	28	10	13	2	...	1	...	3	...	1	...	...	...	2	...	...	...	...	240
133·31	Seathwaite	422	28	27	25	14	19	8	12	8	7	15	4	5	5	1	2	19	3	2	1	1	...	206

ABSTRACT OF THE PRECEDING ANALYSES.

Total Fall.	Year.	No. of Returns	NUMBER OF DAYS ON WHICH THE FALL OF RAIN WAS																			
			Under ·10	·10 to ·20	·20 to ·30	·30 to ·40	·40 to ·50	·50 to ·60	·60 to ·70	·70 to ·80	·80 to ·90	·90 to 1·00	1·00 to 1·10	1·10 to 1·20	1·20 to 1·30	1·30 to 1·40	1·40 to 1·50	1·50 to 2·00	2·00 to 2·50	2·50 to 3·00	3·00 to 4·00	4·00 to 5·00	5·00 to 6·00	6·00 to 7·00
20 in. to 30 in. ...	1865	8	68	30	18	9	5	5	2	1	1	1·1	·5	·4	·2	·5	·1	·9	...	...	...	...	...	...
	1866	7	110	39	18	9	6	3	2	2	1	·4	·1	·3	·1	...	·3	·4	·1	...	...	...	...	...
	1867	13	91	34	19	9	5	3	2	2	1	·7	·3	·4	·3	·1	·1	·3	·2	...	...	...	...	...
30 in. to 40 in. . .	1865	11	75	32	21	13	7	6	4	3	2	·9	·9	·8	·5	·2	·1	·5	...	...	..	...	...	...
	1866	10	100	45	25	16	9	5	3	2	1	·6	·5	·2	·4	·1	...	·1	·1	...	...	...	...	...
	1867	8	95	42	28	14	8	6	4	2	2	·6	·5	·5	·1	·1	·1	·1	...	...	...	...	...	...
40 in. to 50 in. ...	1865	3	65	33	18	19	12	6	8	3	3	·7	·3	1·7	·3	...	·3	·3	1·3	...	...	...	...	...
	1866	4	83	43	29	16	15	8	7	3	2	·7	1·2	1·2	·2	·2	·2	·5	...	...	...	...	...	...
	1867	1	78	35	31	15	9	6	5	5	3	3·0	4·0	1·0	...	...	...	...	...	...	...	...	...	...
50 in. to 60 in. ...	1865	2	46	38	24	19	13	8	7	10	5	2·0	2·0	·5	1·0	1·5	·5	1·0	...	...	...	..	...	...
	1866	1	103	49	40	30	15	9	7	3	1	1·0	...	...	...	...	...	...	...	...	...	...	...	...
	1867	1	103	35	42	28	10	13	2	...	1	...	3·0	...	1·0	...	...	..	2·0	...	...	...	...	...
Above 100 in.....	1866	1	40	34	16	21	13	9	8	14	9	11·0	9·0	5·0	5·0	5·0	2·0	10·0	13·0	4·0	4·0	...	...	2·0
	1867	1	28	27	25	14	19	8	12	8	7	15·0	4·0	5·0	5·0	1·0	2·0	19·0	3·0	2·0	1·0	1·0	...	...
20 in. to 30 in. ...	1865-7	28	90	34	18	9	5	·4	2	2	1	·7	·3	·4	·2	·2	·2	·5	·1	...	...	...	...	...
30 in. to 40 in. ...	1865-7	29	90	40	25	14	8	6	4	2	2	·7	·6	·5	·3	·1	·1	·2	...	...	...	..	...	...
40 in. to 50 in. ...	1865-7	8	76	37	26	17	12	7	7	4	3	1·5	1·8	1·3	·2	·1	·2	·3	·4	...	...	...	...	...
50 in. to 60 in. ...	1865-7	4	84	41	35	26	13	10	5	4	2	1·0	1·7	·2	·7	·5	·5	·3	·7	...	...	...	...	...
Above 100 in. ...	1866 & 7	2	34	30	21	18	16	9	10	11	8	13·0	6·5	5·0	5·0	3·0	2·0	14·5	8·0	3·0	2·5	·5	...	1·0
All returns under 100 in.....	1865	24	69	32	20	13	7	6	4	3	2	1·0	·8	·7	·4	·4	·2	·7	·2	...	...	...	...	...
,, ,,	1866	22	100	43	24	14	10	5	4	2	1	·6	·5	·4	·3	·1	·1	·3	·1	...	...	...	...	...
,, ,,	1867	23	92	37	22	12	7	5	3	2	1	·7	·7	·5	·3	·1	·1	·2	·2	...	...	...	...	...
,, ,,	1865-7	69	87	37	22	13	8	5	4	2	1	·8	·7	·5	·3	·2	·1	·4	·2	...	...	...	...	...

It would be presumptuous and unwise to generalize from these tables—suffice it to say, that they are given in detail, so that any persons may group or discuss them as they see fit. The discordance in the number of days having "under ·10" is puzzling, since I do not believe it *all* depends on the relative care of different observers in recording small quantities. Obviously it makes very little difference in the total *amount* whether each small fall is separately noted or not, and in drainage questions a rainfall of ·01 or ·05 is of no moment; still there are cases wherein strict accuracy in the enumeration of days of rain is necessary, and as this investigation shows these discrepancies in the small entries, I trust observers will be careful not to let showers on two days be entered as one. In all other—that is to say, in all the most important—respects the observations prove very accordant. They show that at an average station in the British Isles there are about—

90	days	with	rain	under	0·10,			yielding	about	4 inches.
40	,,	,,	over	·10	and under	·20	,,	,,	5	,,
20	,,	,,	,,	·20	,,	·30	,,	,,	5	,,
10	,,	,,	,,	·30	,,	·40	,,	,,	4	,,
8	,,	,,	,,	·40	,,	·50	,,	,,	3	,,
13	,,	,,	,,	·50	,,	1·00	,,	,,	8	,,
2	,,	,,	,,	1·00	,,	2·00	,,	,,	3	,,
183	,,	,,	between	·01	and	2·00	,,	,,	32	,,

Whence it appears, that 61 per cent. of the total amount falls in showers of less than half-an-inch per 24 hours, and that only 9 per cent. falls in quantities exceeding an inch in 24 hours. These are the averages, and the results differ according to the total fall, but for stations having from 20 to 35 inches, the proportions above given will probably be nearly correct, and afford a satisfactory reply to the question, "On how many days will half-an-inch of rain fall?"

[Since the above was in type, I have seen in a pamphlet* that Mr. Bazalgette, when designing the metropolitan sewers, had the records of rainfall for a number of years examined, and found that, on the average of many years, there were 155 rainy days annually, whereof only 25 had a quarter of an inch in 24 hours. The mean fall of rain in London being about 24 in., we find from the preceding tables that the number of days having 0·25 or upwards is nearer 35 than 25. I am inclined to think that the former, though only based on three years, is the more correct; but, at the first opportunity, will ascertain the true number. I believe Howard's observations give about 37.]

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* "On the Principles of Town Drainage," by C. Slagg, A.I.C.E. London: Stanford.

ON THE RESULTS OF THE VARIOUS SETS OF EXPERIMENTAL RAIN GAUGES.

THE time has apparently come for careful scrutiny of the observations already made, rather than the commencement of any fresh ones. In fact, one set—the *elevation series* at Calne—have been discontinued, and the instruments laid up in ordinary. The magnitude series will be continued under altered conditions.

The following tables give the annual results for four years, and show how uniform are the returns for different years, and different localities, also that the effect of elevation is very slightly greater in the case of 5 inch than in that of 8 inch gauges :—

Influence of Elevation—8 *in. gauges.*

	Calne.				Castleton Moor.			Calne.	Castleton Moor.
Height above ground...	1864.	1865.	1866.	1867.	1864.	1865.	1866.	Mean.	Mean.
Isolated Level	...	...	1·05	1·05	...	...	...	1·050	...
Level.....	1·05	1·06	1·08	1·08	...	...	...	1·068	...
2 inches.....	1·03	1·05	1·05	1·06	...	...	...	1·048	...
6 inches	1·02	1·01	1·01	1·02	...	...	...	1·015	...
1 foot.....	1·00	1·00	1·00	1·00	1·00	1·00	1·00	1·000	1·000
2 feet	·98	·98	·99	·99	...	...	...	·985	...
3 ,, ...	·97	·98	·99	·98	...	...	...	·980	...
5 ,, ...	·96	·97	·96	·97	·97	·95	·96	·965	·960
10 ,, ...	·95	·95	·95	·95	...	...	...	·950	...
20 ,, ...	·93	·95	·95	·93	·90	·90	·91	·940	·903

Influence of Elevation—5 *in. gauges.*

Height above ground. feet.	Calne.				Castleton Moor			Rotherham.				Calne.	Castleton Moor.	Rotherham.
								Read daily.		Read mnthly				
	1864	1865	1866	1867	1864	1865	1866	1866*	1867†	1866*	1867†	Mean.	Mean.	Mean.
1...	1·00	1·00	1·00	1·00	1·00	1·00	1·00	1·00	1·00	1·00	1·00	1·000	1·000	1·000
5...	...	...	...	...	·95	·93	·95	·95	·95	·94	·93	...	·943	·943
10...	...	...	...	...	...	...	...	·92	·90	·92	·90	...	...	·910
15...	...	...	...	...	...	...	...	·92	·89	·91	·89	...	...	·903
20...	·93	·94	·94	·93	·90	·87	·89	·91	·88	·90	·87	·935	·887	·890
25...	...	...	...	...	...	...	...	·90	·87	·90	·86	...	...	·883

* 10 months. † 11 months.

A careful discussion of Colonel Ward's elevation experiments was undertaken by Dr. Barter, of Bath, in the spring of 1867, but was, of course, confined to the observations 1864–1866. The subsequent year having concluded the series, I think it will be better to render the discussion complete by adding the results in 1867 before publication.

A mere glance at the abstracts on pages 50 to 52 will show the great labour undertaken by those who have so heartily devoted themselves to the work; and a closer scrutiny will show the care with which the observations have been made. The elaborate set of instruments which Mr. Chrimes has at Rotherham are so varied, as to be not only self-checking, but almost speaking—in fact, they do tell us the angle and point of the compass whence every shower comes; and, not only so, they are almost sufficiently sensitive to act as anemometers. This will be seen from the first column of the following table :—

	Rotherham.				Rotherham, 5 ft.			Aldershot, 30 ft.		
	Mean angle from the vertical.	Angle of Inclined Gauge collecting largest amount.	Rain at 1 ft. being 100, rain at 25ft. =	Mean velocity of wind on days with rain.	Mouth of gauge		Ratio.	Mouth of gauge		Ratio.
					Horizontal.	45°		Horizontal.	45°	
	° ′	°		miles.	in.	in.		in.	in.	
Jan. ...	...	..	...	...	...	...	...	2·82	5·58	198
Feb....	46 19	45	78	174	1·69	2·51	149	1·77	3·47	196
March.	69 33	67½	68	193	1·64	4·01	245	2·90	4·74	163
April..	41 28	45	83	211	2·46	3·29	134	2·07	3·91	189
May...	40 00	45	90	166	2·24	2·95	132	1·08	1·42	131
June...	29 33	22½	92	115	1·93	2·23	116	1·29	1·57	122
July...	27 25	22½	96	97	2·18	2·44	112	3·88	5·13	132
Aug ...	17 29	22½	97	84	3·17	3·03	96	1·87	2·24	120
Sept...	22 34	22½	93	106	1·97	1·91	97	1·91	2·53	132
Oct. ...	29 59	22½	88	105	1·97	2·25	114	2·34	3·19	136
Nov...	32 33	45	86	153	·69	·83	120	·34	·48	141
Dec....	60 17	67½	81	164	1·35	2·66	197	1·70	3·50	206
Means.	40 33	...	...	...	...	...	132	...	...	158
Totals.	..	...	...	...	21·29	28·11	...	23·94	37·76	...

It appears that the maximum amount is not in any month collected by the horizontal-mouthed gauge, and that, with one exception, it is collected by that gauge whereof the inclination of the aperture is most nearly at right angles to that of the falling rain. The angle of the falling rain again agrees very well with the velocity of the wind, and the variation due to elevation accords with both.

If our object in planting rain gauges was to collect as much as we could, these experiments show that this would be attained by a gauge whose orifice was at an angle of about 45°, and which was kept face to

wind by a vane; but if in summer it was more horizontal (say 22½°), and in winter more nearly vertical, it would catch more still; in the former case it would exceed a horizontal gauge by 30 per cent., and in the latter by 40 per cent.—values, it may be well to note, agreeing fairly with the diminution of area produced by the oblique fall of the rain.

I need not enforce *here* that our object is not to get the maximum amount of rain, but to ascertain the accuracy with which the gauges in general use give the true fall on the ground—which obviously can neither be tilted to a varying angle, nor wheeled about in azimuth to meet the rain, and wherefore of course a horizontal-mouthed gauge is alone admissible for general use.

I have this year received from Mr. Arnold, of Aldershot, the results of a gauge tilted to 45°, and fixed 30 ft. above the ground. These I have tabulated along with Mr. Chrimes's, because the latter being at 5 ft. above the ground and the former at 30 ft., a comparison of their results might, and I think does, throw light on the cause of the decreased amount in elevated gauges.

An unfortunate mistake of a single figure in *British Rainfall*, 1866, involved some slight (1 per cent.) errors in the analysis of the Magnitude observations at Calne; I have therefore reprinted the table corrected, and with the addition of the results for 1867; there is no alteration of any moment produced by the slight change in height; and it remains as before that "with the exception of gauges one, two, six, and eight inches in diameter, the indications only vary 1 per cent. + or —."

Relative Fall indicated by gauges of different sizes at Castle House, Calne, all 1 *ft. above the ground, until* 1867 *; in that year all* 8 *in. above it.*

Year.	1 in. diam.	2 in. diam.	4 in. diam.	5 in. diam.	6 in. diam.	8 in. diam.	12 in. diam.	24 in. diam.	5 in. square	10 in. square	5 in. flange	5 in. Snowdon.
1864	·93	·96	1·01	1·00	1·03	1·04	1·01	1·00	·98	1·00	1·02	...
1865	·94	·97	1·00	1·00	1·02	1·02	1·00	1·00	1·00	1·00	1·03	...
1866	·92	·95	1·00	·99	1·03	1·03	·99	1·00	·98	·98	1·01	1·03
1867	·92	·97	·98	·97	·99	1·00	·98	1·00	·94	·96	1·02	·98
Mean..	·93	·96	1·00	·99	1·02	1·02	1·00	1·00	·98	·99	1·02	1·00

OBITUARY.

It is with extreme regret I annex a list of contributors whose assistance we can no longer enjoy—most of them personal friends—all workers, for a longer or shorter period, in that field whereof not even a tithe is published in these pages, and some, like Lord Rosse, men not only of this age, but of all time—not merely rain observers; but men of mark, known to all connected with, or attached to, the varied branches of physical research :—

	Period of Observation.
Brooke, W., Esq., F.R.A.S., F.M.S., Norwich	1836 to 1867
Houghton, W. Esq., M.D., The Grove, Portland	1851 to 1858
Morley, G. Esq., St. Brelade's, Jersey	1866 and 1867
Purvis, Rev. Canon, Bangor	1861 to 1866
Richardson, J. Esq., Oak Bank, Kirn, Greenock	1865 and 1866
Rosse, Right Hon. Earl of, F.R.S., Birr Castle, Parsonstown	1862 to 1867
Southall, R. P. Esq., Edgbaston, Birmingham	1855 to 1866
Sugden, J. Esq., Dockroyd, Keighley...	1866
Treby, Henry Hele, Esq., Goodamoor, Plympton St. Mary..	1834 to 1867
Wrottesley, Lord, F.R.S., &c., Wrottesley, Wolverhampton	1843 to 1867

It would be invidious to select any one for special mention without strong reason for so doing; but this seems the case with respect to the late Mr. Treby, of Goodamoor, who was not only himself a careful observer for more than thirty years, but who used the influence which his wealth and position gave him for the promotion of additional observations throughout the counties of Cornwall and Devon. I cite, as an illustration of what one person can do if he keeps his object steadily in view, the fact, that there are no less than twenty-five stations, the establishment of which was, directly or indirectly, due to the perseverance of my late friend,

ON AN INVESTIGATION OF THE MONTHLY PER-CENTAGE OF THE MEAN ANNUAL RAINFALL AT STATIONS SITUATED IN THE BRITISH ISLANDS.

By Frederic Gaster, Esq., F.M.S.

In carrying on an investigation of the many peculiar laws which seem to govern the changes in the fall of rain over the British Islands, one is met at every step by some fresh difficulty. Not the least of these is the fact that before any dependable conclusion can be drawn even on apparently the most trifling subject, a number of observations must be discussed, and a mass of figures made which, to those unacquainted with meteorological calculations, would seem almost fabulous. Then, the effects of heat, humidity and barometrical pressure, each of which is constantly changing, and causing corresponding changes in the others, have all to be considered. As if to add to the confusion, the configuration of the land, and the geographical position of the stations where observations are made, appear to obey no particular laws whatever; and the very gauges themselves, by their different heights above sea and ground, demand more or less correction before their indications can be compared with each other.

Nevertheless, by going through a vast amount of calculation, and carefully discriminating between those places of large and those of small annual rainfall, some laws may be undoubtedly traced, as the following statistics will show.

It is now some time since attention was drawn to the fact, that not only does the mean annual rainfall vary considerably at different parts of the British Isles, but taking the average of a considerable number of years, the portion of the annual fall which occurs in each month varies considerably at different stations. As an example, take the records from a few stations at which rainfall was registered continuously during the decennial period, 1850 to 1859; and in choosing them, we will select those in which the mean annual measurement varied considerably. Thus, we have Leeds (Philosophical Hall), where the mean fall was 21·140 in.; Norwich, where it was 26·085 in.; Exeter (St. Thomas), with a mean of 31·154 in.; Kendal (Westmoreland),

= 44·912 in., and The How = 72·128. We see that at these places the mean annual amounts vary considerably, so that the rainfall at the highest is upwards of three times as great as that at the lowest. Now, if we compare the mean *monthly* values during the same time, we find that they vary too, but do not bear the same proportion to each other as the annual totals do. To make this clear, we give them in the following table; and have represented the monthly values by their per-centage of the total annual fall :—

	Jan.	Feb.	Mar.	April	May.	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.	Mean Ann. Fall
Leeds	7·6	4·3	5·6	8·1	7·3	11·0	10·4	11·4	10·0	10·7	8·3	5·3	21·140
Norwich...	7·5	5·6	4·4	6·9	7·3	6·8	11·9	10·6	9·5	11·3	11·6	6·6	26·085
Exeter....	9·8	6·2	6·7	8·6	7·1	7·5	7·1	6·7	7·8	12·1	9·6	10·8	31·154
Kendal....	12·1	8·6	5·6	5·3	4·9	8·3	8·2	10·6	7·8	9·4	8·2	11·0	44·912
The How..	15·0	9·9	5·8	5·6	4·0	6·2	6·8	8·7	7·1	9·7	8·7	12·5	72·128

It will be observed that no two of these are alike ; and while at one station the maximum fall is in the summer months, at others it is in the middle of winter.

Thus far for their dissimilarity : but it is worth remarking that at all stations the early part of the year is comparatively dry.

On a more minute examination it will, however, be noticed that whilst at Leeds the maximum fall is in the summer, and at the How it is in the winter, the change from one to another is gradual—as shown by the intermediate stations—and that as the mean annual fall increases, the period of maximum falls later in the year.

Now, it is a legitimate question, that if this be the case in the stations thus accidentally examined, may not the same rule hold good with other stations where the same difference in the annual rainfall exists? or, is this gradual change merely accidental, and not generally prevalent? With a view to the determination of these important questions, the mean *annual* rainfall, and the means for *each month*, were determined for all available stations. These means were for decennial periods, and were continued as far back as the records would permit ; and the amounts tabulated. Subsequently, the whole of the monthly averages were converted into values, representing their per-centage of the mean annual fall in each period, and thus about 400 of such sets of averages were obtained.

The decennial period 1850-9 was then chosen, because of the large number of stations at which registers were kept during those years. The registers at the English stations were discussed, and the stations grouped for each 5 in. of mean annual fall between 15 in. and 50 in., and for 10 in. between 50 in. and 60 in. The few stations where the

mean annnal rainfall exceeded 60 in. were combined without reference to their actual amount.

The following table was thus produced :—

Monthly Per-Centage of Mean Annual Rainfall, England, in the years 1850-59.

Mean Annual Fall from	15in.to 20in.	20in.to 25in.	25in.to 30in.	30in.to 35in.	35in.to 40in.	40in.to 45in	45in.to 50in.	50in.to 60in.	Above 60in.	Mean of all Stations.
January.....	7·7	8·0	8·8	9·4	10·3	11·4	9·3	11·8	14·0	10·08
February	4·7	4·9	5·0	5·9	6·5	7·3	7·7	7·3	9·4	6·52
March	5·3	5·2	5·4	5·7	6·6	6·6	5·3	6·1	5·9	5·79
April	6·9	7·1	7·2	7·2	6·9	6·8	5·6	6·5	5·6	6·64
May	7·3	7·9	7·5	6·4	6·0	5·9	4·9	5·5	4·1	6·17
June	8·7	9·1	8·1	8·3	8·4	7·7	9·4	7·5	6·4	8·18
July	12·4	11·6	10·2	8·7	8·3	7·7	9·4	7·7	7·0	9·22
August	11·8	10·6	9·6	9·3	8·9	8·6	10·9	8·8	9·1	9·73
September.....	9·3	9·0	8·9	8·8	8·3	7·6	8·6	8·1	7·1	8·41
October	10·7	11·8	12·6	12·1	11·8	10·9	10·9	10·7	9·9	11·27
November.....	8·9	8·5	9·0	9·1	8·8	9·2	8·7	9·0	8·9	8·89
December	6·3	6·3	7·7	9·1	9·2	10·3	9·3	11·0	12·6	9·10
Stations.....	4	29	28	10	6	4	2	3	3	89

It is almost unnecessary to observe that the same peculiarity is here shown as was exhibited in the small table already given. At those stations where the mean annual rainfall was small, the maximum amount fell in the summer months, whilst, with the increase of the annual fall, the period of maximum fell later, until when the mean yearly rainfall exceeded 60 in., the maximum monthly per-centage was in January.

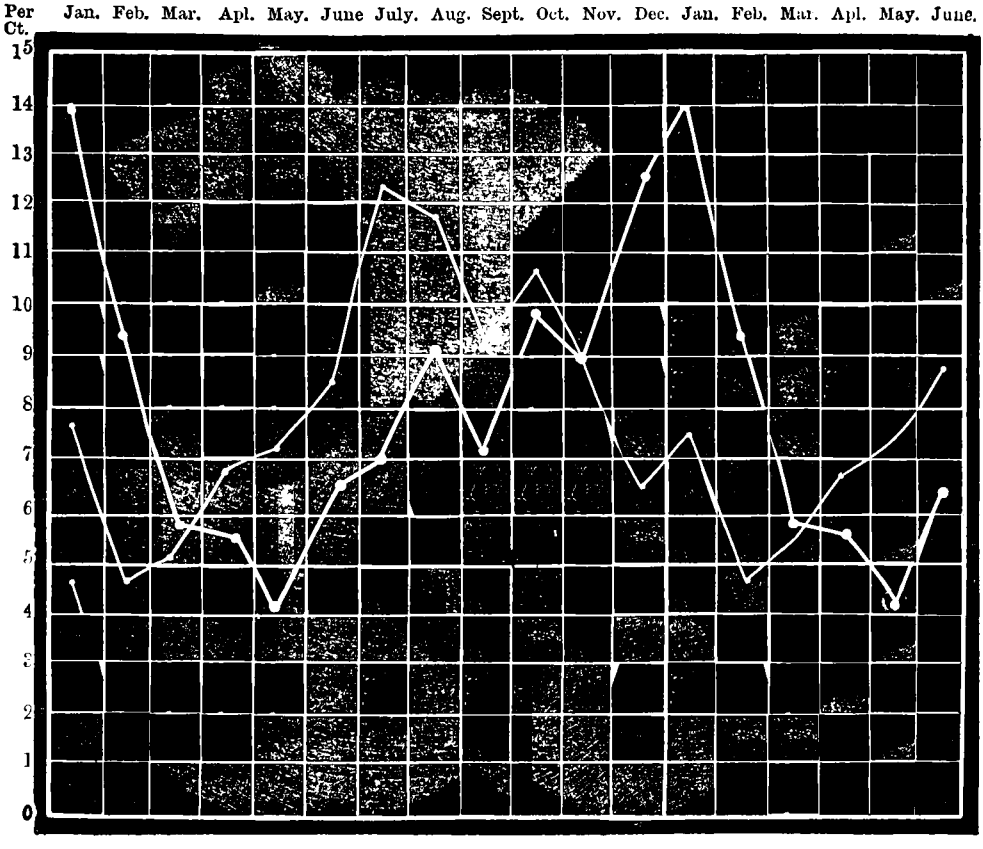
To enforce this, let us compare the "15 in. to 20 in." column with the "above 60 in." column :—

In the former, July = 12·4 per cent. of annual fall.
In the latter, ,, = 7·0 ,, ,, ,,
In the former, Jan. = 7·7 ,, ,, ,,
In the latter, ,, = 14·0 ,, ,, ,,

The marked difference between the per-centage values in these two columns is still more clearly shown in the accompanying diagram. In this, each of the horizontal lines represents 1 per cent. of the mean annual rainfall, and the spaces between the perpendicular lines represent the different months of the year. The first six months are repeated after December, in order to show the true form of the winter curve.

The lighter of the two lines is that for the column 15 in. to 20 in., and has its minimum in February, and its maximum in July; whilst the thicker line (that for the column above 60 in.) rises from its minimum in May, to its maximum in January. Thus, whilst, with the

increase in mean annual fall, the time of the minimum monthly fall has advanced two months in the year, the period of the maximum has advanced six months; and, in the case of the stations with large annual rainfall, these extremes are far more decidedly marked than in that of stations where but little rain occurs.



It thus appears that (in the decennial period 1850-9, at all events), taking the whole surface of England, in places where the mean annual rainfall is small, the general rule is that the maximum monthly portion of that fall occurs in summer, whilst where the amount is very large it is in winter. At places where an intermediate fall is experienced, as a rule the maximum occurs between these two periods (on the *autumn* side); leaning more or less either way, as their mean annual amounts vary.

A question of the following character will now present itself to many of our readers:—

It is a well-known fact that the greatest rainfall in England is found in the west. May it not therefore happen, that, regardless of the mean annual depth of rain, the western stations will present the peculiarity of the winter maximum, while the eastern stations show the summer maximum?

To prove this point, the whole of the stations have been grouped geographically; and the arrangement was as follows:—

The stations were first arranged alphabetically *in the counties* to which they belonged, and the counties were then divided into three districts—Western, Central, and Eastern. No such agreement, however, was found, although in this arrangement the investigation was carried back (as all are now being done) to the very earliest period for which a continuous decennial record is obtained.

Want of space, and the fact that the whole discussion of the observations is not yet complete, forbid our giving many details at present; but the following table, containing the Lancashire records for the period 1850 to 1859, will abundantly prove our point:—

Stations.	Mean Ann. Fall.	Jan.	Feb.	Mar.	April	May	June.	July.	Aug.	Sept.	Oct.	Nov.	Dec.
Belmont	51·190	9·4	7·7	6·1	5·9	4·9	8·1	8·8	11·1	8·3	10·3	9·2	10·2
Bolton	44·006	9·3	8·3	5·9	5·8	5·1	8·6	9·1	9·8	8·5	10·3	9·5	9·8
Coniston	71·400	13·2	9·2	6·2	5·5	4·1	6·6	6·7	9·4	7·3	9·9	9·1	12·8
Fishwick.....	29·103	9·0	6·1	5·3	5·0	5·7	8·9	11·2	12·0	9·3	10·9	8·0	8·6
Holker.....	39·167	10·7	7·4	5·8	6·0	4·4	8·8	9·4	10·5	8·4	10·4	8·4	9·8
Howick, Preston	34·279	9·3	6·9	5·6	5·6	4·9	8·9	10·6	11·2	9·6	9·5	8·2	9·7
Liverpool ...	24·339	7·1	5·0	5·6	6·1	6·1	10·1	11·8	11·7	9·3	11·5	8·9	6·8
Preston, 1 ft.	33·601	9·2	6·5	5·5	5·5	5·2	9·1	10·9	11·8	9·4	10·2	8·1	8·6
,, 53 ft.	28·932	8·6	5·9	5·3	5·3	5·5	9·4	11·2	12·6	9·5	10·4	8·0	8·3
Rufford	33·237	8·7	6·0	5·3	5·5	5·3	9·1	11·2	11·4	8·9	11·3	8·7	8·6
Stonyhurst ...	45·368	9·3	8·4	5·7	5·6	4·5	9·5	9·3	10·4	9·1	10·8	7·9	9·5
Wray Castle..	60·807	13·9	9·1	5·8	5·5	4·3	6·4	7·4	9·1	7·0	10·2	8·7	12·6

We have here—Liverpool with its decided summer maximum, Stonyhurst with its late autumn period, and Coniston, and Wray Castle, with their largest fall in winter.

We return, therefore, to the consideration of the monthly distribution of rain according to the variations in mean annual fall, not however entirely losing sight of the geographical position of the stations.

But it seemed necessary before proceeding any further, to ascertain as far as possible, whether the peculiarities represented in the decennial period, 1850 to 1859, were to be found in other decennial periods; or whether the whole phenomenon shown to exist at that time, might not be peculiar to that time, and to no other. With this view, the same arrangement, according to amount, was made for the periods 1830-9 and 1840-9; but with this distinction: the statistics in the western counties were grouped by themselves—those in the central by themselves, and those in the eastern by *themselves.**

* This will also be done with the period 1850-1859.

The following tables give the results of this inquiry :—

Monthly Per-centage of Mean Annual Rainfall in the Decennial Period, 1830-9.

(Stations arranged in 5 in. groups, according to their mean annual fall.)

Limiting Amounts.	15 in. to 20 in.			20 in. to 25 in.			25 in. to 30 in.			30 in. to 35 in.			35 to 40 in.	40 to 45 in.	55 to 60 in.
Districts.	W.	C.	E.	W.	C.	E.	W.	C.	E.	W.	C.	E.	W.	W.	W.
January.	...	...	5·5	7·1	5·3	6·5	7·0	..	6·9	6·7	...	...	6·0	7·0	7·2
February	...	...	6·4	6·5	7·5	7·9	8·0	...	8·1	7·8	...	...	7·7	8·0	9·4
March ...	...	...	4·6	6·2	6·4	6·3	6·4	...	6·6	7·1	...	...	7·3	7·8	8·1
April.. ..	...	...	6·8	5·2	7·0	6·8	6·0	...	6·4	5·8	...	...	5·7	5·8	4·5
May.....	...	...	7·1	6·6	6·6	6·4	4·7	...	5·7	4·7	...	...	4·2	4·4	2·9
June ...	...	...	11·1	11·0	9·9	10·1	10·2	...	10·5	9·7	...	...	9·9	8·8	8·2
July.....	...	...	10·6	11·2	10·7	8·7	8·1	...	9·7	9·1	...	...	10·0	8·9	9·5
August ..	...	...	9·8	9·8	8·7	9·5	7·7	...	9·5	8·2	...	. .	8·6	8·7	8·1
Sept. ...	...	...	11·4	8·8	11·5	10·4	8·5	...	9·1	8·8	...	...	9·4	9·2	9·5
October..	...	..	10·3	9·5	9·4	10·2	10·1	...	9·1	9·9	...	...	9·7	9·5	10·2
Nov.....	...	...	9·9	10·0	10·4	9·8	13·6	..	10·5	12·8	...	...	11·9	12·5	11·5
Dec.....	...	...	6·5	8·1	6·7	7·4	9·7	...	7·9	9·4	...	...	9·6	9·4	10·9
No. of Stations.	0	0	1	1	2	7	2	0	3	6	0	0	2	1	1

Monthly Per-centage of Mean Annual Rainfall in the Decennial Period, 1840-9.

(Stations arranged in 5 in. groups, according to their mean annual fall.)

Limiting Amounts.	15 in. to 20 in.			20 in. to 25 in.			25 in. to 30 in.		
Districts.	W.	C.	E.	W.	C.	E.	W.	C.	E.
January	...	...	6·6	8·2	7·2	7·0	8·2	8·0	7·8
February.....	...	...	4·8	7·1	7·0	6·2	6·6	7·4	6·8
March	...	..	5·1	5·7	5·5	5·9	6·1	6·2	6·0
April	...	...	6·6	7·0	6·3	6·7	6·2	6·6	6·1
May.....	...	...	10·5	7·1	8·4	9·0	7·4	7·6	8·0
June.....	...	...	9·0	8·8	8·2	7·5	7·7	7·7	7·8
July.....	...	...	9·7	9·6	7·8	9·6	8·6	7·7	9·7
August.....	...	...	10·0	10·0	9·9	10·6	9·8	10·0	9·9
September ...	...	...	9·5	8·3	11·2	9·2	9·5	9·6	8·9
October	...	...	13·6	11·2	11·9	12·7	11·4	11·7	12·4
November ...	...	...	7·8	10·1	9·9	9·4	11·2	10·4	9·9
December ...	...	...	6·8	6·9	6·7	6·2	7·3	7·1	6·7
No. of Stations	0	0	1	2	1	8	3	4	7

Monthly Per-centage of Mean Annual Rainfall in the Decennial Period, 1840-9.—*(Continued.)*

(Stations arranged in 5 in. groups, according to their mean annual fall.)

Limiting Amounts.	30 in. to 35 in.			35 in. to 40 in.			40 in. to 45 in.	50 in. to 55 in.	55 in. to 60 in.	70 in. to 75 in.
Districts.	W.	C.	E.	W.	C.	E.	W.	W.	W.	W.
January...	9·4	...	9·5	8·9	..	10·0	9·7	9·8	9·7	10·6
February..	7·0	...	8·3	6·8	...	8·2	7·4	7·3	8·5	7·6
March ..	6·6	...	5·7	6·6	...	5·5	6·8	7·3	6·5	7·4
April	6·7	...	5·4	6·0	...	5·6	6·0	5·4	6·0	5·0
May	6·9	...	6·8	6·7	...	6·7	6·2	5·2	6·4	4·9
June	7·3	...	5·7	7·6	...	5·9	6·9	7·3	6·7	6·3
July	8·5	...	7·1	9·0	...	7·4	8·4	9·1	7·1	8·4
August ...	8·7	...	9·5	9·5	...	9·5	8·9	8·5	7·8	8·6
September	8·8	...	9·4	8·5	...	8·5	8·3	7·4	8·1	6·6
October...	11·0	...	12·4	11·5	...	11·9	10·8	11·9	10·6	12·8
November	11·3	...	12·1	11·2	...	13·4	11·4	11·5	13·9	12·0
December.	7·8	...	8·1	7·7	...	7·4	9·2	9·3	8·7	9·8
No. of Stations.	4	0	1	2	0	1	7	2	1	1

In these the same peculiarity is noticed which was seen in that for 1850 to 1859. It is scarcely so distinct as in the former case, however, owing to there not being a sufficient number of observations. There are also some cases among the separate stations which will need special notice on a future occasion.

Let us now endeavour to retrace our steps a little, and see what has been made evident thus far :—

Firstly, then. If we take an average of a considerable number of years of the rainfall at various English stations we find that, not only do the mean annual amounts vary, but the monthly per-centages of those amounts also vary considerably.

Secondly. That (with some exceptions) the time of year when the maximum monthly amount occurs, changes with the variations in the mean annual rainfall; stations where little falls having their maximum in the summer, but those where the fall is large in the winter months.

Thirdly. That, so far as the present investigation has proceeded, these laws hold good in all the three districts into which we have supposed the country to be divided.

Fourthly. That at stations where the rainfall is very large, the minimum monthly fall occurs about two months later in the year, and the maximum about six months later than at those of smaller amount; and that in the former case these periods of extremes are more clearly defined than in the latter.

Let it, however, be remembered that at present the work of examining the records, with a view to acquiring some better understanding of this peculiarity, is still in hand, and being pushed forward with all possible speed. It has been mentioned briefly at present merely to show what is being done; and to point out some of the important facts which are likely to be deduced.

A valuable paper by Mr. Glaisher, published in the last number (No. 33) of the "Proceedings of the Meteorological Society," leads us to hope we shall be materially assisted by the sea observations of rain in the North Atlantic Ocean; and thus we may anticipate a considerable insight into the *causes* of effects so remarkable as those described. It is much to be regretted that no rain-gauge observations (or *exceedingly* few) are, or can be, made at sea; and also that so little notice is taken by land observers of the *frequency*, or *hours*, of rainfall. A connecting link, to unite the registration of ocean rainfall with that on land is very greatly needed; and the sooner observers, or others, can arrange some uniform system, the better for every one.

In conclusion, let it be said that steps are now being taken to discover—(1) If the variations in the monthly distribution referred to above are caused by local peculiarities of the land, or otherwise? (2) If by local causes, what those causes are? (3) What is the effect of the height of the gauge above ground, and above the sea level? It is almost unnecessary to point out that great difficulty must be experienced in carrying on such a work; but it is hoped that untiring perseverance and careful management may in this, as in so many other cases, be master in the end.

NOTES ON THE RAINFALL AMONG THE CUMBERLAND MOUNTAINS FOR THE YEAR 1867.

By Isaac Fletcher, Esq., F.R.S.

In those parts of Cumberland which are distant from the mountains, the year 1867 has been one of remarkable dryness, but among and on the mountains the average fall of rain has been very nearly if not quite maintained. I compute that the average annual fall at Seathwaite is 134 inches; at that station the fall for the past year is 133·31 inches, whilst on the Stye it is 184·71, or two inches below the mean of the previous two years, the latter of which was remarkable as giving the unprecedented quantity of 224·56 inches. The mean at this station, as obtained by Dr. Miller for the four years ending with 1853, was 162·94 inches, and the maximum (1850) 189·49 inches.

The only change I have made in the distribution of the gauges since the close of 1866, is the abandonment of the Mosedale Station, and the transfer of the gauge to Taylor's Gill, also on the Stye, at the same height above sea level, and only 300 yards distant from the old gauge. The result obtained in 1866 on the Stye was so extraordinary, and was received with so much incredulity, even by well informed and experienced meteorologists, that I determined to be armed against another year with additional evidence. Accordingly I planted a sentinel at Taylor's Gill, away from the track of tourists, and well screened from observation. It will be seen how well the two run together.

1867. Month.	The Stye.	Taylor'sGill	Difference.
January	21·82	18·10	3·72
February.....	24·32	19·85	4·47
March	10·05	8·96	1·09
April	22·86	19·80	3·06
May	6·59	6·16	·43
June.....	6·48	6·05	·43
July	15·11	13·54	1·57
August.....	20·05	18·80	1·25
September ...	15·00	15·24	+ ·24
October	19·54	16·80	2·74
November ...	Frozen	Frozen	
December ..	22·89	20·40	2·49
Total	184·71	163·70	21·01

To those who are conversant with the partial distribution of rain in mountainous districts, this comparison will speak for itself; I therefore merely record my own satisfaction.

The only anomalous circumstance developed by the year's observations, is that contrary to former years more rain has been received at Styehead Tarn than at Sprinkling Tarn. Moreover the difference is considerable (10·75 inches), and is distributed with some regularity throughout the months of the year. I am unable to account for this fact.

Notwithstanding the great rainfall indicated by the mountain gauges, I believe the actual amount to be much greater, and that much rain is lost to the gauges by reason of the funnels being frequently stopped up by snow and hail. At Seathwaite I have two gauges, both giving identical results under similar circumstances; the one is read daily and the other monthly. I give below the monthly returns from both, together with those from Mr. Symons's 8 in. gauge, also read monthly.

1867. Month.	Miller's, Read daily.	Fletcher's, Read mnthly.	Difference.	Symons', Read mnthly.	Difference.
January	15·66	10·40	5·26	16·00	+ ·34
February.....	17·05	14·75	2·30	14·50	2·55
March	8·32	7·64	·68	7·50	·82
April	16·92	15·49	1·43	16·50	·42
May.....	5·25	4·41	·84	4·50	·75
June	4·90	4·02	·88	4·00	·90
July.....	10·43	9·70	·73	9·75	·68
August	13·05	13·03	·02	12·25	·80
September ...	12·47	11·75	·72	11·50	·97
October	13·67	12·48	1·19	12·50	1·17
November ...	2·55	2·04	·51	2·75	+ ·20
December ...	13·04	10·25	2·79	10·75	2·29
Totals	133·31	115·96	17·35	122·50	10·81

Now it will be observed that except in those months where there was frost and snow, the difference in the receipts of the two gauges is not more than may be fairly (considering the structure of the gauges) attributable to evaporation, and I have purposely had the monthly gauge left to itself during each month, with a view of approximating to the loss in the other mountain gauges from the causes indicated. If, therefore, we admit that at Seathwaite the monthly gauge has lost 11 or 12 inches from frost, snow, and ice, in a situation comparatively free from their influences, we may fairly assume that in more elevated and exposed positions the loss is in all probability much greater, and in many cases may amount to from 12 to 18 inches in the aggregate. During the past year no accident has happened to any of the gauges, nor have I the smallest reason to believe they have been molested.

Indeed, they are in most instances so well concealed that they cannot easily be found by a stranger. Thus my excellent and indefatigable friend Mr. Symons, in the autumn of 1866, when on a tour of inspection and verification among the contributary gauges to this volume, cruized for hours among the rocks and defiles of Wasdale Head and the Styehead Pass in search of my gauges, and he must forgive me for expressing my satisfaction at the total failure of his expedition. He could not find one of them!

As somewhat connected with the subject of these remarks, I wish to add a few words on the subject of evaporation, a subject surrounded with difficulties of all kinds, so much so as to call from Mr. Symons the remark, "I don't believe in evaporators!" The only important experiments on this subject that have been published, so far as I am aware, are those of Mr. Luke Howard and Dr. Miller, the former being made in London, and the latter in Whitehaven. Mr. Howard found the annual evaporation about 20 inches, but as the vessel was *covered*, it is obvious that this amount must be far too small. Dr. Miller found the average evaporation, by uninterrupted daily observation for 12 years, to be 29·664. He employed a dish 8 in. in diameter, which during the day was exposed to wind and sun, though too much sheltered by surrounding walls. During rain and at nights it was placed under a capacious shed 9 ft. high, open at front. In this manner it may at first sight seem that all legitimate influences are fairly at work; but it seems to be open to two grave objections. The immediate removal to a place of shelter when rain commences, is dependant on the vigilance of the person in charge, and when under cover during rain, evaporation must be greatly impeded, and at nights this will continually operate to the diminishing of the true amount. The apparatus I have employed is a dish 8 inches diameter, so contrived as always to have in it half an inch of water. The dish is accurately bored and turned to a knife edge; it is four and a half inches deep, and has a tap in the bottom, through which the water is discharged into a measuring tube. It is five feet from the ground, alongside a rain gauge at a similar elevation. Half an inch of water (additional to the initial half inch) is poured in every morning, and re-measured the following morning, allowance being made for the rain (if any) in the interval. Thus it will be seen that the water in the dish is exposed freely at all times to all the influences which either promote or retard evaporation; nevertheless it is open to three objections, two operating unduly to increase the apparent amount, and one to diminish it; and for these I can find no remedy. The material of the dish becomes unduly heated by the sun in warm weather, and in heavy rains there is some little loss by

splashing. The sides of the dish necessarily shelter the surface of the water from wind, rain, and sunshine. The following table shows the rainfall and evaporation for four years at five feet elevation :—

	1864.		1865.		1866.		1867.	
Month.	Rain.	Evap.	Rain.	Evap.	Rain.	Evap.	Rain.	Evap.
January ...	2·989	1·227	3·640	1·617	8·183	2·949	3·616	·874
February...	2·002	1·760	3·272	1·247	4·726	2·213	2·504	2·107
March	3·381	2·571	2·407	3·234	2·940	2·719	1·261	3·397
April	2·164	4·751	·667	5·218	·998	5·736	5·094	4·226
May.....	2·113	6·105	6·609	6·271	1·929	7·372	1·999	6·852
June	3·229	5·449	·749	7·364	2·420	6·406	1·576	6·278
July.....	1·702	6·230	3·589	7·228	4·487	6·496	3·615	6·247
August ...	5·359	5·581	3·483	5·200	3·464	4·753	3·632	5·639
September.	3·680	4·194	2·268	4·174	6·967	3·871	4·624	4·764
October ...	3·058	3·159	3·434	2·872	2·432	2·400	4·603	2·793
November..	5·004	1·698	4·193	1·691	6·399	2·518	·724	1·824
December..	6·844	1·504	4·965	1·919	5·845	2·116	3·534	1·334
Totals ...	41·525	44·229	39·276	48·035	50·790	49·549	36·782	46·335

The mean evaporation is 47 inches, a quantity vastly in excess of the amount arrived at by Mr. Howard and Dr. Miller, but I believe it to be more correct than either.

TARNBANK, *January 6th*, 1868.

RAIN GAUGE EXPERIMENTS AT FRAMFIELD LODGE, HURST GREEN, SUSSEX.

By the Rev. T. E. Crallan.

The special objects in view in the experiments undertaken here at the beginning of the year were—first, to ascertain the respective merits of certain materials for funnels of rain gauges; secondly, the respective merits of different forms of construction; thirdly, whether there would be any difference in the amounts given by daily and monthly readings; and lastly, the amount of evaporation from an open vessel.

In the first place, the gauges were placed upon a shelf, so that their rims should be at the uniform height of three feet above the ground, as shown in the engraving in *British Rainfall*, 1866, p. 21. They were secured, or attempted to be secured, in their places by thin rope, stretched from end to end of the shelf, as is also shown in the engraving. The results of the first two months are of no value, owing to various disturbing causes. The severe cold interfered much with me. The stone bottle gauge and the evaporator were both burst by the frost, and portions of their contents lost. Then the contraction and relaxation of the ropes allowed some of the gauges to be displaced from their vertical position during the night time, and I was obliged to replace the ropes by thin iron rods. It was thus two months before I got fairly started. I append tables of the results from the beginning of March to the end of September, and these may be depended on as accurate, except the return of No. VIII. for July.

At the commencement of March I added another of Casella's gauges, with a much larger receptacle and bottle; this will be numbered XV. in the table. Subsequently, at the beginning of July, one of Mr. Stevenson's was added, which was sunk in the ground, so as to have its rim three-quarters of an inch above the earth, for comparison with the zinc gauges already at that elevation. This will be numbered XVI. in the table.

Now for the results. First, as to material. The ebonite gives the largest amount collected, the earthenware the least, the glass the next least. I am decidedly of opinion that the deficiency of these two is to be attributed to two causes. First, there is more capillary attraction on earthenware and glass than on any of the other materials, and unless a certain considerable quantity of rain falls, it hangs in drops on the surface of these funnels, and evaporates without running down into the receptacle at all. The other cause is the shortness and width of the tubes, and the consequent larger evaporation. I do not think this of much moment, but the ebonite, which gives the largest amount, has the narrowest and longest tube, as well as the best conducting surface. The length of the tube, however, is the best preventive of evaporation; the width does not seem to make so much difference.

On the whole, I should discard glass and pot funnels, and, in fact, with them all substances which offer any considerable amount of capillary attraction. A dull smooth surface allows the rain to run on it most freely, and of all the substances under my charge, ebonite seems by far the best. Zinc, however, seems very excellent in this respect.

As to construction, I have only to remark that the nearer the rim approaches the vertical in its exterior the better. Of the eight gauges which give the largest results, those numbered I., III., VI., XI., have very slightly sloping rims; of the remaining four, the high reading of V. is owing most probably to its material; VIII. is habitually in excess, from some cause at present undiscovered, and should have appeared more so, but that one rainy night in July it ran over, and so lost some portion of the rainfall. No. IX. being read daily, escapes loss from evaporation, but loses the amount adhering to the jar inside. and occasionally has a few drops of dew, too small in quantity to measure; these may perhaps balance one another. No. XV. was at the extreme end of the shelf, where the wind may have affected it. Certainly, however, I know from observation that very many drops of rain which fall on the slightly inclined rims of I., III., VI., XI., are in windy weather blown up and over into the gauge, thus adding to the contents a certain quantity of rain which ought not to be there. I would, therefore, discard all gauges with such rims.

The only other point as to construction I have already alluded to, viz., the tube, which should certainly be as long and narrow as possible.

There appears no noticeable difference between the gauge No. IX., read daily, and those read monthly of the same construction, No. IX. and No. XV. being nearly alike.

The table shows the amount of evaporation from an open vessel to

be more than half as much again as the amount of rainfall on the whole period. It was, however, less than the rainfall during March and April, and in excess afterwards, as might have been expected.

Of the gauges on the ground, *i.e.*, sunk in the earth with their rims three-quarters of an inch above the surface, it will be seen that the ordinary funnel gauge received about one inch more rain than the highest amount registered on the shelf. I am inclined to attribute this principally to insplashing, because No. XIII., in a similar position, received 1·69 less than its companion.

Mr. Stevenson's gauge, which I had during the last three months of my experiments, I consider a total failure. It is only graduated for tenths of an inch, and therefore is not nearly accurate enough. The only means I can discover of emptying it is by pouring the water out through the glass tube at the side, through which it will only run in driblets.* This operation is so tedious that no one would go through it daily. It is difficult in this way to extract all the water, so as to be certain that the next reading will be accurate. It is also closed, so that there is no means of cleaning the inside in case it should get foul, as I find all gauges do from various causes, birds, &c. I altogether look upon it as expensive, clumsy, and inaccurate—three serious faults in my opinion.

Like all other parents, I suppose, I incline to my own offspring, No. XIII., or to a modification of it, for I cannot help feeling that the object to be obtained is the amount of rainfall on a given space of the ordinary surface of the ground, and this I think will be best obtained by constructing a gauge to represent, as nearly as possible, that surface. In order to do this, it is necessary that the portion enclosed to collect the rain should be nearly horizontal, instead of funnel shaped, so as to allow of out-splashing to compensate for in-splashing. However, even this after all is subordinate to the importance of having all our gauges, if possible, of the same construction, and all at the same height above the ground. If this could be attained, the results would enable us to compare the rainfall at different localities, since even if we did not know the real rainfall at each locality, we should have a measure which would serve for all purposes of comparison.

Here, perhaps, I may be allowed to raise the question, whether the increase in the amount collected by gauges as they are placed nearer the ground is not due to the path described by the falling rain drop?

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* We believe there should have been a hole near the top of the funnel for this express purpose. See figure of gauge in Buchan's "Handy Book of Meteorology," page 112.—Ed.

Whether, in fact, the paths of the drops do not approach each other as they near the earth?

Does this accouut for the size of hailstones, hail falling from clouds at great altitudes, the drops approaching and coalescing in their fall? If this be so, hailstones of any size would be possible, if the hail clouds were at a sufficient elevation. Then we might believe the account of an Indian hailstorm published in the *Meteorological Magazine* for June last.

I trust the results of my experiments may be of some use, and regret that, in consequence of my removal to another sphere of work, they have been brought to an earlier close than I had anticipated.

FRAMFIELD LODGE, HURST GREEN,
November 19*th*, 1867.

[To this we have only to add, that fresh rims have been provided for such of the gauges as required them, so as to secure uniformity; that four new ones have been added whose rims are inclined to the horizon, 22½°, 45°, 67½°, and 90°; that the whole of them have been transferred to Strathfield Turgiss Rectory, Hants, where we hope they will remain, under the careful scrutiny of the Rev. C. H. Griffith, until the mysteries of their indications are solved. So far as we can see, the original object of enquiry (the effect of different materials) remains unattained; but, as is often the case, in our efforts to discover one fact, we seem to have stumbled on a far more important one, in the angle of the rain gauge rim.—ED.]

RESULTS OF EXPERIMENTAL GAUGES AT FRAMFIELD LODGE, IN 1867.

Numbers.....	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	XI.	XII.	XV.	XIV.	XIII.	XVI.
Description of Gauge	Black can.	Black can.	White. can.	Black can, pot funnel.	Ebonite, black.	White can, wet sand.	Amount of evaporation.	Casella, stone bottle.	Black can, read daily.	Black can, glass funnel.	Black can.	Long white protected	Black can, large.	Zinc funnel, on ground.	Zinc disc, no funnel, on ground.	Stevenson, on ground.
MONTHS.																
March	2·54	2·51	2·52	2·40	2·52	2·43	1·91	2·65	2·44	2·49	2·61	2·46	2·45	3·21	2·81	...
April	2·27	2·16	2·31	1·95	2·35	2·45	2·40	2·30	2·18	2·20	2·26	2·21	2·33	2·38	2·29	..
May.....	2·05	1·96	2·09	1·96	2·14	2·05	3·10	2·08	1·97	2·01	2·15	2·02	2·04	2·05	1·94	...
June	1·95	1·88	1·96	1·80	1·85	1·96	4·79	1·96	2·05	1·74	1·96	1·96	1·96	2·26	1·74	..
July.....	5·01	5·07	4·93	4·81	5·22	4·97	6·49	4·70?	5·10	4·85	5·12	4·92	5·16	5·39	5·25	4·65
August	2·16	2·09	2·16	1·98	2·26	2·16	5·93	2·24	2·34	1·91	2·21	2·13	2·16	2·20	2·00	1·60
September	2·27	2·24	2·26	2·07	2·37	2·23	5·21	2·30	2·22	2·14	2·32	2·22	2·28	2·30	2·07	1·70
Totals	18·25	17·91	18·23	16·97	18·71	18·25	29·83	18·23?	18·30	17·34	18·63	17·92	18·38	19·79	18·10	7·95
Totals for March April, May.....	6·86	with tube 6·63	6·92	6·31	7·01	6·93	7·41	7·03	6·59	6·70	7·02	6·69	6·82	7·64	7·04	...
Totals for June, July, Aug. Sept.	11·39	without tube. 11·28	11·31	10·66	11·70	11·32	22·42	11·20 ?	11·71	10·64	11·61	11·23	11·56	12·15	11·06	...
Totals on ground, July, Aug. Sept.	...	...	...	...	...	...	...	...	...	...	...	...	...	9·89	9·32	7·95

RAINFALL AT CASTLE HOUSE, CALNE, WILTS.

Lat. 51° 27′ N. Long. 1° 59′ W. 250 ft. above Mean Sea Level.

FOR THE YEAR 1867.

ELEVATION SERIES. Diameter of Gauges, 8 inches.

Height above ground	Turf Gauge	Isolated Level.	Level.	2 in.	6 in.	1 ft.	2 ft.	3 ft.	5 ft.	10 ft.	20 ft.	20 ft. 5-inch gauge.
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Jan.	4·388	3·671	*7·880	*7·626	3·514	3·359	3·292	3·207	3·166	3·063	3·003	2·868
Feb.	1·976	2·210	2·278	2·182	2·052	1·952	1·966	1·918	1·837	1·757	1·696	1·710
March	3·832	3·526	4·315	3·930	3·502	3·268	3·208	3·191	3·191	3·104	2 785	3·300
April	2·516	3·343	3·354	3·328	3·228	3·225	3·194	3·145	3·059	2·968	2·935	2·866
May	·470	1·832	1·812	1·817	1·793	1·789	1·777	1·771	1·764	1·750	1·742	1·640
June	1·225	2·245	2·243	2·235	2·197	2·187	2·186	2·169	2·183	2 125	2·115	2·000
July	1·463	3·788	3·691	3·736	3·686	3·684	3·680	3·678	3·654	3·615	3·601	3·404
Aug.	1·429	3·078	3·056	3·054	2·994	3·019	2·993	3·003	2·995	2·967	2·955	2·883
Sept.	·723	1·843	1·813	1·840	1·799	1·793	1·782	1·781	1·774	1·748	1·715	1·631
Oct.	1·757	2·899	2·913	2·898	2·871	2·862	2·832	2·815	2·786	2·755	2·717	2·657
Nov.	·989	1·324	1·317	1·275	1·264	1·266	1·261	1·247	1·218	1·209	1·192	1·130
Dec.	1·990	1·810	1·840	1·843	1·730	1·670	1·620	1·578	1·560	1·535	1·530	1·510
Totals	22·758	31·569	32·512 *	31·764 *	30·630	30·074	29·791	29·503	29·187	28·596	27·986	27·599

* Vitiated by snow; 4 inches deducted from totals.

MAGNITUDE SERIES. Gauges 8 inches above the ground.

Diameter.	1 in.	2 in.	4 in.	5 in.	6 in.	8 in.	12 in.	24 in.	5 in. square.	10 in. square.	5 in. flange.	5 in. Snowdon
	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.	in.
Jan.	3·146	3·370	3·404	3·268	3·448	3·545	3·441	3·784	3·417	3·519	3·591	3·458
Feb.	2·075	2·066	2·070	1·796	2·003	2·097	2·104	2·140	1·991	2·073	2·176	2,001
March	2·361	2·965	3·042	3·135	3·050	3·068	3·192	3·317	2·620	3·328	3·140	2 885
April	3·093	3·135	3·211	3·126	3·206	3·272	3·187	3·210	3·124	3·118	3·284	3.213
May	1·788	1·740	1·820	1·819	1·867	1·850	1·765	1·808	1·750	1·695	1·828	1.798
June	2·021	2·186	2·217	2·158	2·231	2·237	2·148	2·176	2·075	1·990	2·237	2 208
July	3·442	3·691	3·733	3·733	3·756	3·803	3·645	3·651	3·530	3·511	3·806	3 693
Aug.	2·925	3·000	3·019	3·071	3·034	3·031	2·953	2·941	2·873	2·814	3·077	3·065
Sept.	1·720	1·727	1·773	1·771	1·792	1·818	1·760	1·758	1·667	1·630	1·801	1·785
Oct.	2·785	2·807	2·795	2·824	2·831	2·875	2·828	2·830	2·771	2·710	2·831	2·855
Nov.	1·228	1·200	1·225	1·308	1·313	1·298	1·282	1·258	1·269	1·253	1·300	1·308
Dec.	1·610	1·711	1·663	1·630	1·683	1·720	1·717	1·721	1.694	1·652	1·740	1·700
Totals	28·194	29·598	29·972	29·639	30·214	30·614	30·022	30·594	28·781	29·293	30·811	29·969

RAIN GAUGE EXPERIMENTS, BOSTON RESERVOIR, ROTHERHAM.

Lat. 53° 25′ N., Long. 1° 20′ W. 381 ft. above the Sea Level.

FOR THE YEAR 1867.

	FIVE MOUTHED GAUGE.					INCLINED ROTATING GAUGES.				
Height above ground.	5ft.					5 ft.				
Months.	Facing East.	Facing North.	Facing West.	Facing South.	Horizon Centre.	22½°	45°	67½°	90°	Tipping
January	...	...	...	...	...	...	...	...	...	..
Feb. ...	·094	·068	1·326	1·028	1·688	2·250	2·514	2·408	1·767	2·027
March..	2·317	1·531	·219	·817	1·643	3·050	4·012	5·160	4·405	1·970
April ...	·320	·229	1·161	·962	2·464	3·057	3·286	2·842	2·178	2·967
May ...	1·324	·774	·067	·307	2·241	2·866	2·947	2·676	1·880	2·614
June ...	·151	·960	·327	·201	1·928	2·263	2·225	1·790	1·093	2·103
July ...	·806	·359	·177	·366	2·184	2·497	2·441	1·920	1·133	2·369
August.	·462	·095	·553	·668	3·171	3·314	3·033	2·004	1·007	3·260
Sept. ...	·355	·112	·107	·539	1·968	2·057	1·908	1·223	·818	1·768
October	·228	·173	·580	·678	1·969	2·314	2·254	1·808	1·136	2·114
Nov. ...	·101	·386	·079	·072	·691	·817	·829	·697	·441	·728
Dec. ...	·121	1·298	1·094	·707	1·353	2·241	2·664	3·027	2·370	1·994
Totals..	6·279	5·985	5·690	6·345	21·300	26·726	28·113	25·555	18·228	23·914

ELEVATED GAUGES.

Height above ground	1 ft.			5 ft.			10 ft.		
Months.	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.
January.....	...	...	...	...	...	...	...	...	...
February	1·875	1·926	+·051	1·708	1·742	+·034	1·627	1·623	—·004
March	1·902	1·956	+·054	1·705	1·735	+·030	1·380	1·428	+·048
April	2·696	2·745	+·049	2·505	2·497	—·008	2·385	2·412	+·027
May	2·428	2·504	+·076	2·308	2·351	+·043	2·198	2·271	+·073
June	2·016	2·086	+·070	1·947	1·970	+·023	1·875	1·914	+·039
July	2·273	2·333	+·060	2·197	2·235	+·038	2·134	2·203	+·069
August	3·222	3·203	—·019	3·173	3·140	—·033	3·141	3·162	+·021
September.....	2·035	2·069	+·034	1·977	1·985	+·008	1·917	1·963	+·046
October...	2·079	2·122	+·043	1·977	1·963	—·014	1·899	1·938	+·039
November... ..	·743	·746	+·003	·702	·702	·000	·665	·670	+·005
December	1·532	1·696	+·164	1·349	1·483	+·134	1·305	1·448	+·143
Totals	22·801	23·386	+·585	21·548	21·803	+·255	20·526	21·032	+·506

RAIN GAUGE EXPERIMENTS, ROTHERHAM—(*continued.*)

ELEVATED GAUGES.

Height above Ground.....	15 ft.			20 ft.			25 ft.		
Months.	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.	Read Daily.	Read Mnthly.	Diff.
January.....	...	..	...	...	..	...	...	...	...
February	1·572	1·618	+·046	1·561	1·540	−·021	1·451	1·492	+·041
March	1·339	1·357	+·018	1·284	1·315	+·031	1·277	1·350	+·073
April	2·304	2·397	+·093	2·322	2·298	−·024	2·196	2·196	·000
May	2·189	2·244	+·055	2·163	2·210	+·047	2·180	2·230	+·050
June	1·908	1·911	+·003	1·870	1·876	+·006	1·835	1·878	+·043
July	2·091	2·117	+·026	2·088	2·103	+·015	2·061	2·087	+·026
August	3·103	3·111	+·008	3·092	3·112	+·020	3·112	3·124	+·012
September.....	1·885	1·924	+·039	1·894	1·934	+·040	1·893	1·928	+·035
October.....	1·868	1·902	+·034	1·862	1·884	+·022	1·833	1·863	+·030
November	·666	·662	−·004	·643	·638	−·005	·634	·634	·000
December	1·302	1·469	+·167	1·275	1·418	+·143	1·248	1·387	+·139
Totals	20·227	20·712	+·485	20·054	20·328	+·274	19·720	20·169	+·449

RAINFALL AT THE ROYAL OBSERVATORY, GREENWICH.

FOR THE YEAR 1867.

Above Mean Sea Level.	155ft. 3 in.		156ft. 6in	164ft10in	177ft.2in.	193ft.2in.	205 ft. 6 in.	
Above Ground.	0ft. 5in.	0ft. 5in.	1ft. 8in.	10ft. 0in.	22ft. 4in.	38ft. 4in.	50ft. 8in.	50ft. 8in.
Description of Gauge.	Glaisher's 8 in. diam. read monthly.	Glaisher's 8 in. diam.	Crosley's	Glaisher's 8 in. diam.	Troughton 6 in. diam.	Glaisher's 8 in. diam.	Diameter 12 in.	Receiving surface, 10in by20in self-regist.
	in.	in.	in.	in.	in.	in.	in.	in.
January ...	2·80	2·79	2·40	2·34	1·54	1·70	1·37	1·33
February...	1·21	1·22	1·20	1·14	0·86	0·94	0·69	0·72
March	2·30	2·28	2·08	2·16	2·17	1·63	1·46	1·41
April	2·10	2·16	2·11	1·98	1·34	1·51	0·90	0·99
May.....	2·20	2·34	2·09	2·16	2·06	2·03	1·79	1·78
June.....	1·51	1·77	1·62	1·60	1·45	1·42	1·23	1·20
July.....	5·30	5·81	5·24	5·28	4·58	4·35	3·45	3·39
August.....	2·50	2·64	2·41	2·40	2·04	2·20	1·94	1·98
September..	2·61	2·92	2·55	2·57	2·26	2·38	2·15	2·09
October ...	1·93	2·14	1·69	1·68	1·47	1·46	1·19	1·21
November .	0·42	0·42	0·40	0·41	0·23	0·29	0·23	0·21
December..	1·70	1·97	1·42	1·43	1·09	1·13	0·75	0·72
Sums ...	26·58	28·46	25·21	25·15	21·09	21·04	17·15	17·03

RAINFALL AND METEOROLOGY

OF

1867.

ON THE METEOROLOGY OF 1867,

WITH DETAILS OF THE PRINCIPAL PHENOMENA.

JANUARY.

2nd.—Heavy fall of snow in the home counties between 5 and 11 a.m., the total depth being about 8 in. Great hindrance to railway and other traffic from the drifts, which were in some cases 20 ft. deep.

3rd, 4th, and 5th.—Severe frost—the temperature falling to, or even below, zero at several stations in the Thames Valley; lowest at Epsom —12°, and East Peckham, —10°.

7th.—Frost gone; a S.W. gale sweeping across the country; temp. above 50° in many places; damage to the extent of £10,000 or £15,000 by the breaking up of the ice in the upper part of the Wear, the ice driving the vessels one against another. Subsequently, a N.E. gale blew with considerable violence, causing several wrecks. Very heavy floods were reported from all parts of the country; in some cases, it was said they even exceeded those of November, 1852. The Severn is said to have been more flooded than since that year.

12th.—The frost returned with very heavy snow, especially in Perthshire and Forfar; the temperature at many places fell to 15° and 10°.

14th—Naples.—A letter, dated 16th, says:—"For some days we had been laughing about a prediction in an almanac, published by the editor of the *Naples Observer*, that on the 13th or 15th there would be "a great tempest of wind and rain;" and, sure enough, on the 14th we had a storm—nay, a hurricane—from S.E., such as no one remembers to have seen in Naples, and such as has not occurred during the long interval that I have known the place.

16th.—Snowstorm in the United States—the heaviest for 10 years; snow 20 in. deep on level, and 20 ft. in drifts. 5,000 sleighs passed through the gates of the central park at New York.

22nd.—Severe frost continues, with excessive snow in the east of Scotland. A sharp shower of rain fell on the frozen ground, which it thereby coated with a sheet of ice. It began in London about 7 p.m., at Leatherhead at 8 p.m.; it was also noticed at Nottingham, Glasgow, and other places.

23rd.—Great floods in Yorks.; five trains snowed up on the North British Railway.

26th.—Six third class passengers insensible from the cold, on the arrival of the carriages (which were not glazed) at Brujala, Spain.

OAKHURST, HASTINGS.—Snowstorm commenced at 11 p.m. on 15th; between 4 and 5 a.m. on 16th the fall increased, and there was a gale; by 9 a.m. the snow was 12 in. deep (this included about 3 in. of old snow); at 10 the wind increased to a heavy gale from the N., and the appearance of the drift over the country was a sight I shall never forget. My man and myself in the road could not see literally two yards, so blinding was it. In fact, this ridge was being fed by the snow from the large valley which lies N. At 11 a.m. the road was impassable, the drift being from 3 to 8 ft. deep. At Ore, my man tells me, a waggoner who had started from Robertsbridge at 4 a.m., being near the end of his journey, attempted to force his way, with four horses; the snow was higher than the waggon and fifteen sacks of beans; the first horse got embedded, with an archway of snow over him. The road from my gate as far as I can see (a quarter of a mile) is from 4 to 12 ft. deep, and firm enough for a large dog to walk upon it without going in.

MELBURY HOUSE.—On morning of 8th Jan., and preceding night, tremendous storms of snow, wind, rain, lightning, &c. 1·70 in. of rain fell.

GREAT TORRINGTON.—The year began with frost; there was a heavy fall of snow in the afternoon and night of the 1st of January; the thaw came with the gale of the 7th. Frost returned on 11th, continuing very severe till the 22nd, when the ther., showing a night temp. of 23°, rose to 46° in the day, and continued rising, until it reached 52°. The lowest temperature was on the 15th. Min., 8°.

STONE HOUSE, GLOUCESTER.—7th, bar. fell suddenly to 28·59, and was followed by a severe snowstorm.

BRAMPTON, DERBY.—Min. in year, 7°·5 on 20th.

HOLKER CARTMEL.—Min. of year, 11° on 4th.

WEST HENDON.—Greatest average depth of snow, 11 in. from 16th to 19th.

PRESTEIGN.—From 10th to 23rd hard frost, down to zero on several nights.

TONGUE.—Snow fell on 18 days in January—12 in. deep over the low ground.

CREGG PARK.—The early part of the year was more severe than usual; snow fell on the 5th, 12th, 14th, and 16th.

ANTRIM.—The year 1867 began with a great snowstorm, in which

many persons throughout the north of Ireland perished. Snow continued on the ground from the 1st to the 22nd inclusive.

FEBRUARY.

WALTHAM ABBEY.—A severe storm passed over here at 4 a.m., 6th February: bar. at 7 a.m. 28·78, and at 10 a.m. 28·84.

WELLS-NEXT-THE-SEA.—The thunderstorm of the the 7th of February was terrific; little Walsingham Church struck by lightning.

MELLS.—Heavy gales in the night of 5th; trees blown down.

KILLINGHOLME.—Vegetation forward; frogs croaking in a pond as if spawning had begun on 16th, and by the 23rd there was abundance of spawn. Violets in bloom on 23rd.

WEST HENDON.—Vegetation remarkably forward at the end of the month.

PRESTEIGN.—Gales on 7th, 8th, and 9th; bar. on 6th, 28·7. An immense fall of snow, drifts in the hills 40 ft. deep; a great number of small birds died; wind generally E.; no communication with other places for several days; temp. 8° on 17th. Great floods after the snow melted.

14th.—Earthquake at Cephalonia.

MARCH.

STAFF COLLEGE, SANDHURST.—On 7th, at 1 p.m., a fall of soft hail or miniature snow-balls occurred; wet and dry bulb both at 33°.

MELLS.—Snow more or less from 6th to 20th, when thaw set in; heaviest fall on 19th, ground covered to depth of 6 in. Eclipse of sun seen all through. Heavy gale on 17th.

CLIFTON.—On the evening of the 19th the snow was 12 in. deep on the level, far deeper than I have ever known it.

ST. THOMAS, BRAMPTON.—On 20th, soft hail with crystalline snow fell in dense showers of frozen particles like pin-heads of ice.

WHITFIELD.—Snow fell without intermission from 2 p.m. on 7th, to 2 p.m. on 9th; it fell on 16 days in this month.

CASTERTON.—Up to 6th fine, but at 11 a.m., one hour after the eclipse, the wind veered to N.E., with snow showers to the 22nd.

PRESTEIGN.—Snow 13 in. deep on the level, and within three miles of here, drifts from 20 to 30 ft. deep; many birds killed.

LLANFRECHFA.—Snow fell on eight days in this month, which was much more severe than January; many lambs died in exposed situations.

GORDON CASTLE.—Remarkable for 10 days severe frost, doing great injury to apricots and other fruit trees then in blossom.

BALLINLONTY.—Snow on the 12th, 13th, 18th, and 20th.

9th.—Flight of locusts at Malta. Martins seen on the banks of the Thames on the 22nd, unusually early. The melting of the snow caused such a rise in the Seine that it marked 17 ft. on the scale at Pont Royale, stopping all navigation; while at Malta at the end of the month they were in fear for their crops in consequence of the drought.

APRIL.

COBHAM, PYPORTS.—Swallows appeared on 10th.

OAKHURST.—Nightingale first heard on 17th; usually heard about 1st.

SUTTON PARK.—Two thunderstorms broke over here with great violence between 4 and 7 p.m. on 10th, 1·41 in. of rain fell and a large number of hailstones: very great damage was done by the hail and rain.

BEXWELL.—14th, rain all day, and at 4 p.m. a hurricane with thunder.

HILLINGTON.—14th, swallows seen and cuckoo heard; nightingale on 16th. Thunder and lightning for nearly 24 consecutive hours on 27th.

KILLINGHOLME.—Swallows seen on 12th; willow warbler first heard on 18th; cuckoo 26th.

ST. THOMAS, BRAMPTON, DERBY.—On 10th part of the roof of Chesterfield Church injured by the parapet being blown through it; 12th, first swallows seen, and a small white butterfly.

WHITFIELD.—20th, 1·23 in. fell between 7 p.m. and 8 a.m. next morning.

MAY.

COBHAM, PYPORTS.—The potatoes and beans much injured by frost; some of the ferns quite black.

BROMLEY.—Heavy snowstorm on 22nd, with hail and thunder, followed by sharp frosts. Heat intense from 6th to 10th.

SHEERNESS.—Thunderstorm on 10th from 9 to 10 a.m.

PEVENSEY.—The coldest May since 1837.

BOURNEMOUTH.—A month of changes: hot to 12th, cold to 25th, hot to the end of the month; thunderstorm on 9th for three-quarters of an hour; severe frost on 24th, cutting young shoots, &c., to pieces.

May 21.—STRATTON AUDLEY PARK.—During the late hailstorms, 3 hailstones weighed a pound!*

* Hailstones are great troubles to a Meteorological Editor. In the *Meteorological Magazine*, Vol. I. p. 52, some large ones were mentioned, with a note suggesting that their size was exaggerated. On p. 108 of the same volume a writer said that it was a hoax, and we rather think so. In Vol. II., p. 53, details were given of an extraordinary fall in India, which Mr. Crallan comments upon on p. 48 of this work. And here is another case, authenticated by a gentleman of high standing, of three hailstones weighing a pound—that is to say, each one containing a frozen quarter of a pint of water. Will any one object to this statement? We shall not, remembering full well the pitiable aspect of a pony which had been so pelted by hail in a shelterless field that he was all over lumps.—ED.

KENSWORTH.—On 22nd, an extraordinary fall of snow, with terrific gusts of wind; the storm lasted nearly an hour—the ground quite covered; several slight showers afterwards during the day.

BROOK HOUSE, CAMBRIDGE.—Thunderstorm on 10th and 11th, from 11.45 to 12.30; at 12.25, vivid flash, with crashing thunder 50 yards off. During the storm in Cambridge, a horse was killed; at Barrington, 7 miles S.W., one man was killed, and another injured on same date; 6.45 to 8 p.m. almost incessant thunder and lightning; violent rain and hail from 7.10 to 7.40; heavy rain from 8.15 to 8.30; hail as large as nuts; rain in the early morning of 11th, with thunder and lightning. Total rainfall, 1·15.

AMPTHILL.—An inch of rain fell in a storm of hail and rain on the 10th, after three days of great heat, especially on the 6th; 22nd of May very cold, and a snowstorm.

PICKENHAM HALL.—Severe storm on 11th.

WEST TOFTS.—On the 10th a very heavy thunderstorm—1·92 in. of rain in two hours.

BEXWELL.—22nd, showers of hail and snow.

HUNSTANTON.—16th, frost, injuring the potatoes very much; 21st, severe thunderstorm between 3 and 4 p.m.

KNAPTOFT HALL.—Potatoes, young shoots of trees, &c., cut off by the frosts of the 22nd, 23rd, and 24th.

KILLINGHOLME.—Lesser whitethroat heard on 2nd; the garden warbler had been heard for some days on the 16th; potatoes injured by frost on 17th; the leaves have opened rapidly, and have a fresher tint than usual; slugs more destructive than they have been for a long time.

ST. THOMAS, BRAMPTON, DERBY.—11th, hawthorn in blossom; 22nd, snowstorm, soft hail nearly half-inch in diameter.

MACCLESFIELD.—On 13th and 16th ther. registered 35°, being 1° less than on the previous Christmas-day.

THE WOOD, WINDERMERE.—Last snow on 23rd.

WEST HENDON. — Vegetation forward at the beginning of the month; after which, the leaves of many kinds of trees were much injured.

OTTERBOURN.—Severe thunderstorm on 6th.

CARLESGILL.—Ice on 14th.

DUNDEE.—A cold, cheerless month, with 26 days of biting east winds.

ANTRIM.—From 18th to 25th cold east winds, injuring vegetation.

May 6th.—Excessive heat, mean daily temp. 66°, or 14° above the average.

23rd.—Mean at Tunbridge, 38°·5. Mr. Plant reports this morning the ther. marked 25°. Such severe cold is unparalleled in the present century for the fourth week in May.

JUNE.

PEARCELANDS, W. HOATHLY.—Thunderstorm on 3rd; one and a half in. of rain in 2 hours.

ALDERSHOTT.—Dry bulb 82° on 27th, wet bulb 57°, difference 25°.

ABINGTON PIGOTTS.—As regards the remarkable dryness that prevailed at the latter part of June, I give you the readings of the driest day of the year, June 27th; readings at three p.m., bar., uncorrected, 30·564, att. ther. 68°·2, dry bulb 75°, wet bulb 57°·0, dew-point 44°, humidity 33°; calm blue sky with N.E. light cirri.

MATTISHALL.—No rain after the 15th.

FRIESLAND, MANCHESTER.—On 10th, 1·60 in. of rain fell in half-an-hour, tearing up roads on the hill side.

SOUTH SHORE, BLACKPOOL.—Only 0·02 of rain fell from the 11th to the 30th.

BALTHAYCOCK.—Wet and cold summer up to the 8th.

TRINITY GASK.—During a thunderstorm on 3rd the greatest rainfall on record at this station took place; between 9 a.m. and 4 p.m. 1·75 fell. The greatest fall previously recorded, was on the 12th June, 1860, when 1·60 fell in 24 hours.

At the end of June the salmon were found lying, dead or dying, on the banks of the Eden, in Cumberland, supposed to have been caused by the heat of the weather, the same having occurred under similar circumstances last year.

JULY.

HAMPTON WICK.—2 in. of rain on 26th and 27th.

BRIXTON HILL.—25th, 2 in. of rain fell in less than 10 hours.

NEW FALCONHURST.—Thunderstorms on 13th and 18th.

LONG WITTENHAM.—1·08 in. of rain on 5th, chiefly in 20 minutes: 1·20 on the 26th in two hours.

SOMERLEYTON RECTORY.—Thunderstorm on 14th, thunder and lightning from S.W., very partial, passing over parish of Somerleyton round Hopton to sea; places on either side, such as Lowestoft, had little or none of it; hailstones about three-eighths of an inch in diameter.

WEST TOFTS.—Thunderstorm on 26th, but not so heavy as in some parts of the country.

LEICESTER.—·88 of rain fell in half-an-hour on 13th.

STRINES DALE.—On 10th 2·29 in. of rain fell in the short period of

two hours; while at Oldham, only one mile and a half distant, the fall was only 0·60 in.

BRYN ALYN, MOLD.—On the morning of the 18th, soon after 9, nearly 1 in. of rain fell in a few minutes; I was so much occupied by the overflowing of spouts and gutters that I cannot be quite accurate as to the duration of the downpour, but it certainly did not exceed ten minutes or a quarter of an hour.

CARLESGILL.—Potatoe shaws blackened on 27th.

BALTHAYCOCK.—The greatest fall of rain in recollection, most of which (7·70) fell from the 15th to 24th.

GORDON CASTLE.—Nine or ten very cold days in this month.

NORTHAM VICARAGE.—On 15th (St. Swithin's) ·15 in. of rain fell between 6.10 and 6.25 p.m., time rather less than more; the rain came down like a sheet of water.

16th.—The cannon firing of the Naval Review was heard at Malvern, Exeter, and Castle Frome, Herefordshire, all between 120 and 150 miles distant.

AUGUST.

BROMLEY.—Two violent storms at 2 a.m. and 4 a.m. on 20th. Wind E.S.E.

NEW FALCONHURST.—Thunderstorms on 14th and 19th.

MATTISHALL.—Ther. on north wall 85°·7 on 14th.

HILLINGTON.—14th, heat excessive, a hot breeze blowing; harvest men suffered greatly. Several deaths in different places from sunstroke.

NORTON-IN-HALES.—Thunderstorm for 3 hours on 13th. 21st, harvest commenced, and was uninterrupted till the 30th.

BROMSGROVE.—Terrific thunderstorm on 19th.

KILLINGHOLME.—The first wheat was cut in this parish on 15th; the harvest generally began on 19th.

BRAMPTON, DERBY.—On 19th great thunderstorm at night; river Hipper flooded higher than for 20 years; trees swept away, and people removed from upper stories in boats in Shipley Street; Claycross tunnel flooded, trains delayed five hours.

DUFFIELD, NEAR DERBY.—20th, at 1 a.m. a fearful thunderstorm which lasted about two hours; rain fell heavily, deluging the streets and houses for about three hours; 2·34 in. fell during that time. The crops are injured, but I have not heard of any loss of life.

WOODLAND MOUNT.—1·33 in. of rain fell principally between 7 p.m. on 15th, and 4 a.m. on 16th.

OTTERBOURNE.—Severe thunderstorm on night of 19th and 20th;

commencing at 8 p.m., and being nearest at about half-past 11 ; there appeared to be three storms, one in N.E., one in E., and one in S.; three seconds was the shortest time between the flash and sound. I distinctly saw one flash ascend in a curled form like a snake ; the flash sometimes appeared like a star, as if it had come or gone endlong. Rain came in bursts.

HOLKER, CARTMEL.—The hottest day in 1867 was 13th August; temp. in shade 86°.

BRECON.—1·04 in. of rain in two hours on 31st.

DUNDEE.—Heavy thunderstorm on 20th; finest growing month this year.

BALLYHYLAND.—From the 16th of August to 14th Sept. harvest time. Rain fell on 28 days out of 30, and to the depth of 5·43 in.

MARKREE.—Great thunderstorm between 6.30 and 7.30 on 13th, shortest time interval being 17 seconds.

SEPTEMBER.

GLYNDE.—1·19 in. of rain on the 9th in two hours—the heaviest I ever witnessed.

BROOK HOUSE, CAMBRIDGE.—Thunderstorm on 3rd, from 8 a.m. to noon ; rain 1·06 in., principally falling between 10 and 11 a.m.

EAST DEREHAM.—On 3rd rain began at noon, and lasted till 4 p.m., wind E. Distant thunder was heard, and a flash or two of lightning seen about 3 p.m.

MILDENHALL.—The heavy fall on 3rd occurred during a heavy thunderstorm, in less than one hour between 6.15 and 7.15 a.m.

MELBURY HOUSE.—On 3rd (there having been lightning on the previous evening), about 4 a.m., there was an alarming storm of thunder, hail, and rain, with forked and sheet lightning incessantly.

LUPTON, BRIXHAM.—During thunderstorm on 3rd 1¼ in. of rain fell in little more than one hour.

BELGRAVE, SIDMOUTH.—For some days previous to Monday, the 2nd, the atmosphere had been oppressive, causing a great desire to lie down and rest. On that evening I was called into the country, and on my return, at 9 p.m., I felt the air to be unrespirable, the clouds looked heavy, and the sunset had been red and fiery ; the bar. stood at 30·17. The thunderstorm commenced between 1 and 2 a.m. of 3rd, with lightning so vivid, that you might almost count the ropes of the vessels in the offing—the flashes varied in colours almost prismatically. The thunder sounded closer than I had ever heard it, and resembled a regular fusilade of 56-pounder guns. The clouds looked a perfectly black mass during the storm ; and at its conclusion, when

broken up, about 4 a.m., presented a most wonderful appearance. Ozone papers were not affected, reading the same as on the preceding and following days.

GREAT TORRINGTON.—Very violent thunderstorm, lasting here in force about an hour, viz.—3 to 4 a.m. At Newton, 7 miles S.W., the church tower was struck, a horse killed, and another injured.

NEWTON ABBOT.—The rainfall recorded on the 3rd was during the magnificent thunderstorm, and fell almost all in half an hour. I never shall forget the first dash of it against the windows; it came as if thrown from a pail. The lightning was continuous for three hours; but we were evidently between two storms, the hills on either side of Newton Abbot taking it away from us. It was the most beautiful sight I ever saw.

BATH PARAGON.—3rd, thunderstorm between 5 and 6 a.m.; previous day very hot, 77°·5 in shade; distant lightning all night. I do not remember such a storm in Bath before. Bar. showed no signs, being 30·10, wind E. to S.S.E.

BOYCE COURT, DYMOCK.—Thunderstorm on 2nd and 3rd, when 1·58 fell in little more than 24 hours.

BROMSGROVE. — Violent thunderstorm on 3rd, re-commencing at 3·45 p.m. (there having been a slight one in the morning). In half an hour the water ran in the streets like small rivers; the baskets, buckets, &c., of the market people (it being market day) were floating about, the houses flooded, cellars filled, &c. 1·65 in. of rain fell during the storm, and ·23 in. of rain fell during the previous one.

RUGBY.—At 6 p.m. on 3rd it was so dark from cloud, that a candle had to be lighted to finish writing a letter. About 7 the storm commenced; and, from that time till 9.30 the thunder and lightning was almost continuous, accompanied by a tropical fall of rain, 1·50 in.; cattle and sheep were killed by the lightning. There was no particular depression in the bar., but after the storm it fell.

BRAMPTON, DERBY.—Thunderstorm all day on 3rd.

LEICESTER.—Severe thunderstorm on 3rd.

KILLINGHOLME.—Swallows congregating as for departure on 5th; swarms of black flies on the 11th. Harvest well got; yield of wheat deficient, probably owing to its ripening too rapidly. Some say that the frost in June, when the wheat was in flower, did the mischief; very little gossamer, and very few webs of garden spiders.

GUERNSEY.—On the 10th upwards of 1½ in. of rain fell in two hours.

DUNDEE.—Very fine harvest weather; corn nearly all cut, and fully half in the stack yard.

COOLLATINE PARK.—Hurricane from 2 to 3.10 on 11th.

OCTOBER.

LONDON.—Oct. 5 almost like winter; open spaces round London covered by frost, and ice on the lakes.

CAMBRIDGE.—18th, brilliant meteor, and, although daylight, it appeared as bright as Venus; but very low alt., 90°. It was seen to fall to the earth at the village of Longstanton.

BRAMPFORD SPEKE.—Only three dry days in the month.

WALLASEA.—6th, a most extraordinary storm of thunder, and hail five-eighths of an inch in diameter.

THE WOOD, WINDERMERE.—First snow on the hills on 3rd.

WEST HENDON.—A little snow on the 4th; much earlier than I ever before knew it.

TINTERN ABBEY.—0·069 in. of rain fell in 25 minutes on the 16th, the heaviest fall I have ever seen, except in a thunderstorm. It is considered by the farmers in this neighbourhood that the seed-time this autumn has been the finest ever known.

DUNDEE.—October a very fine month—a kind of second summer after the 10th; Grampians covered with snow on the 3rd.

ANTRIM.—October had a great number of rainy days, owing to which the grain crops were badly housed, and suffered much in stook.

29th.—Fearful hurricane at Tortola and at St. Thomas, partially destroying the town, causing the death of hundreds of the inhabitants, and wrecking a large number of vessels. A very similar hurricane occurred at St. Thomas on the 6th of August, 1837, the account of which would almost do for that of the present year.

NOVEMBER.

PEVENSEY.—The finest November I ever remember.

HAMPTON WICK.—Remarkable for its extreme dryness, only three days on which it rained.

BRIXTON HILL.—Less rain than in any other month.

CHILGROVE.—Driest since 1851, when only ·95 in. of rain fell. In November, 1856, 1·04 fell.

LISS.—Only ·29 in. of rain in the first 29 days.

STRATTON AUDLEY PARK.—The unusual drought in November till the fall on the 30th, following two or three dry months, caused a scarcity of water here in November, putting farmers to inconvenience from a short supply of water for cattle in the fields; so great a scarcity at that period was unknown to the oldest inhabitant.

WOODFORD (near Salisbury).—Up to 9 a.m. on the 29th, only ·30 in. of rain fell; late in the afternoon of the 30th = ·24; making total of ·54.

CHAGFORD.—November was a very exceptional month for this part

of the country; such beautifully fine weather has not been remembered by the oldest inhabitant.

Brampford Speke.—Only five days with rain.

Saul Lodge, Stonehouse.—The atmospheric pressure in November was very great, ranging the greater part of the month to above 30·50, 30·60, and for four days, 30·70; and, with the exception of the heavy rainfall on the 15th, it was a remarkably dry month.

Manchester.—Nearly two-thirds of the rain fell in one day.

Otterbourne.—A most remarkable month; moors were burnt all the month, and the oldest person cannot remember seeing moors burning during November at all.

Thirlestane.—Never saw the ground so hard and dry in the autumn as it was in November last.

Coollatine Park.—Bar. above 30 in. 17 days in November.

Cregg Park.—November remarkably dry, and thus causing Lough Corrib to be lower than ever remembered at that time of the year.

DECEMBER.

1st.—Terrific gale both at sea and on land.

12th.—Full moon and high tide burst the sea banks at Ingoldsmell, Lincolnshire. No one unacquainted with this coast can form any idea of the giving way of a sea bank—those on the South Coast, Hastings, or St. Leonards, for instance, where the tide goes back only 10 or 20 yards, while on this it runs 200 or 300. Labourers had, on Tuesday, been making a cradge dyke—really an artificial bank—by which about ten acres of land would be again given up to the sea. This was inefficient; and the sea bank has holes in it from 70 to 100 yards in length.

Friesland, Manchester.—Continuous fogs for the latter part of the year.

Middlesborough.—Dec. 1st, wind shifting from S.W. to N.E. about 3 p.m., blowing a very heavy gale, and very dark and stormy night; 2nd, still stormy, with showers of sleet. The tides have been unusually high, and immense loss of life and property.

West Hendon.—This month remarkable for its very sudden changes of temperature.

Glanton Pyke.—Sunday, Dec. 1st, a fine calm forenoon; at 2·30 p.m. a violent storm of wind arose in a moment from N.E.; and on Monday a very fine specimen of Procellaria Leachii was picked up near here, still alive, but much exhausted. It died soon afterwards, and I have had it stuffed. Glanton Pyke is 12½ miles from the sea, as the crow flies.

OBSERVERS' NOTES ON THE YEAR 1867.

I.

LINTON PARK.—Of the remarkable features of 1867 the greatest may be said to be the short period between the latest spring frost and the earliest autumn one—viz., from May 25th to Sept. 25th, which is the shortest time I have on record for some 25 years. True, now and then I have heard of frosts in July or August, but I never witnessed them, and the instrument did not detect them.* The frosts in May were very destructive in many places; here they were more so to the young growth of deciduous trees, than to the fruit blossom, which on the whole resulted in a fair average crop. The winds as taken at noon each day, and only regarding the eight cardinal points, record a greater number from the south than on any former occasion for 18 years, excepting 1863; and, strange to say, those from the north have also been in excess; the S.W. about an average, and all the rest under that. The number of days in each direction were as follows:—E. 13 days, S.E. 24, S. 80, S.W. 72, W. 46, N.W. 27, N. 59, N.E. 42, and two days were not ascertained, making 365. Usually the S.W. wind brings rain with it, and that from the contrary direction dry weather, but the greatest rainfall in the year (that of July 26th) was from N.E., when 1·51 in. fell—confirming the current belief of the district, that when rain does fall from that quarter it comes in greater quantities than from any other, as was exemplified on another occasion in the past year. As usual, the readings of the barometer, as taken at noon each day (not always the maximum or minimum), showed both higher and lower figures in the autumn and winter months, than in the summer: the highest being 30·42 on the 2nd of March, and the lowest 28·23 on the 8th of January. Of the thermometer I speak with more diffidence, as I do not fully understand or coincide with all that is said to constitute shade; but I may say that the hottest day by 5° was August 14th, when a reading of 90° was made, while only 61° was attained the next day. The next hottest day to the one

* But they are "downright facts," nevertheless.—ED.

alluded to was May 7th, 85°; and no day in June or July exceeded 80°. The coldest day was January 5, 10°; but, stations less than a mile from us approached zero. The coldest day in December was the 10th, when 19° was registered—the number of frosty days during the year being 94, and rainy days 176, both being about the average.

II.

FOREST LODGE, MARESFIELD.—The leading meteorological feature of the year just past has been the wholly unprecedented persistence of the direction of the wind, which has blown from points about the E. and N. for nearly half (or, more correctly, 0·40) of the year.

III.

CAMBRIDGE OBSERVATORY.—Mean temp., 48·5; dew point, 44·0; mean humidity, 78.

IV.

ST. PETER'S, IPSWICH.—We have had a very cold season, considerably over the average (of rain ?), in this part of the country, with snow and sleet.

IXWORTH.—On the whole, the coldest year I ever experienced; rains in July unusually heavy, especially on the 26th.

BURNHAM, NORFOLK.—Average of last 28 years, 28·07; 1867 = 25·95. The annual fall of rain has been below the average for 11 years, with the exception of 1860. The result is apparent in the very dry state of the substrata of the fields, and the frequent claying up of strong springs.

V.

BRIDPORT.—Average fall of rain for last 10 years, from 1857 to 1867 = 30·65.

BRAMPFORD SPEKE.—Total of 1867 is identical with that of 1865.

GREAT TORRINGTON.—I have registered more rain this year than in either of the preceding years. Average for 5 years, including 1867 = 35·24; the days of rainfall are under the average. We have had much more snow than usual.

ST. SENNEN, NEAR THE LAND'S END.—The total fall seems small; but, after two years' residence, I am convinced that our fall is not large. The rain clouds, apparently pass to the north and south, up the two channels, or pass over the Land's End in clouds and mist, falling in rain beyond the range of hills, which terminate in Chapel Carn Brea, 2½ miles distant.

VI.

BARLASTON.—Rainfall, 1866 = 36·13 in 195 days; 1867 = 31·37 in. in 163 days.

VII.

STRETTON FIELDS, HINCKLEY.—A wonderful year for grass, caused by the equal distribution of rain in the months of May, June, July, and August.

WIGSTON.—The rainfall of 1867 about 1·10 in. below the average of the last 30 years; the number of days considerably below the average, being 22 less than in 1858, when the total fall was only 22·00.

LOUTH.—My returns were (?) last year; but I am quite sure the returns now made, for the third time, are quite correct.

WELBECK.—The rainfall at Welbeck Abbey, in 1867, was nearly the same as 1866, both years being about 2 in. above the average; the mean temperature, as recorded here, was 48°, or half a degree higher than 1866. The failure, then, of the cereals and fruit crops was not so much due to the want of summer heat, or to excessive moisture, as to the extreme changes of temperature in May, June, and July. August was a very fine month, with, at times, a nearly tropical heat, which pushed on the harvest rapidly to maturity. As the deficiency of rain in 1864 and 1865 is now nearly equalized by the falls of 1866 and 1867, we may expect a finer and warmer summer in 1868, and more especially as the cycle of bad seasons rarely extends over two or three years running.

CHATSWORTH.—A very wet, dull, and cold year, with unusual variations of temperature, and generally unfavourable to vegetation.

VIII.

RUFFORD.—The average rainfall here for the 21 years, 1847 to 1867, was 34·91; the greatest fall 45·11, in 1848; the least, 27·66, in 1855.

OLD TRAFFORD.—The fall of 1867 has been more than an inch below the average for the last 73 years.

CATON.—Average, 19 years = 39·66; average, 1860 to 1866 = 44·85.

IX.

COTTINGHAM, NEAR HULL.—I have sometimes been in trouble with leaves, &c., getting into the funnel; but have found a half-penny put in the funnel a good check to hold back dirt, which can be removed before it gets to the part where it would be mischievous.

Beverley Road, Hull.—0·30 above the average of last 10 years; wettest year during that period, 1860 = 31·74; driest 1864 = 18·27.

X.

Hesleyside.—Rain in 1867 far below our average, which is about 45 in. The fall in November is the smallest I ever remember.

Whinfell Hall.—Rainfall about 7·75 below the average of the last 12 years. What would be the effect (if any) in our rain-tables, comparing one year with another, if the rain year was made to commence at one of the equinoxes?

Penrith.—The driest year, as to amount of rainfall, I have ever recorded. On the other hand, the number of days on which (measurable) rain fell, and humid showery (but unmeasurable quantities) days was great, and total amount of solar heat very small.

XI.

Dingeston (4 miles W. of Monmouth).—I believe that more rain by one third falls at Monmouth, 4 miles E., because the clouds follow the hills N. and S. of this place, and meet and fall at Monmouth. Also, the rivers Wye and Monnow meet there.

Haverfordwest.—The year 1867 was the third in wetness of the last 20 years. The wet years stand thus:—1860 = 56·99; 1852 = 55·90; 1867 = 55·87; 1866 = 54·97.

Pen-y-Maes.—During 1867 there have been 203 days on which the wind has been westerly.

Alderney.—Average (17 years) = 28·40; 1867 = 27·23 in.

XII.

Cargen.—The rainfall of 1867 is 10 in. less than 1866, and 19 in. less than 1865.

Dumfries.—The total fall is 0·88 in. under the average (5 years).

Carlesgill.—Though the rainfall of 1867 is 3·41 below the average of the last 25 years, the heavy and continued rain in March, April, September, and October, coupled with a low temp., have told heavily, both on the quantity and quality of our crops. The year began sharply; heavy drift snow on the 22nd of March.

Springwood, Kelso.—The average fall (14 years) is 24·92 in. Max., 84° on the 13th August; min., 2° on the 2nd and 4th January.

XIV.

Bothwell Castle.—Notwithstanding that 1867 has (in this district) been a cold, cloudy, sunless year, the rainfall has been 1·18 in. below the average fall of the last 24 years.

CESSNOCK PARK.—I see, by the newspaper, more rain fell at the Observatory N.W. of Glasgow, and at Pollockshields, on the S., than at this place. The Observatory is on a hill, declining down to the Kelvin on the N., and to the Clyde on the S. and W. My gauge is a little above the Clyde, in the centre of a garden. Mr. Gardner has a hill on the S. of his place. I often see the rain-cloud showering on the S. when I have no rain, or only a few drops.

XV.

DUART MULL.—Heavy rains from S.S.W.; heavy storms from N.N.W.

INVERARY CASTLE.—Surrounded as we are by high hills, which break the currents of air from the western ocean, the rain falls in very heavy showers—in fact, the local physical formation of this place determines its climate. The great general laws which regulate the distribution of heat and moisture may be constant and uniform in their action; but local peculiarities, for wise purposes, must never be lost sight of in meteorological conclusions. Our whole year surpassed anything I ever witnessed for cold and unsettled weather; the 1st of August only reached 75°. Oats ripened pretty well, but were indiffer ently secured; potatoes freer from disease than last year.

XVI.

LENY.—Winter cold and prolonged; spring the same, snow on the hills on the 17th of May; summer cold, wet, and ungenial; autumn fine, with the exception of the large rainfall in October, and coldness of its commencement. A most brilliant decay of foliage; the finest November I ever remember, many days like summer.

LOGIE ALMOND.—The fall of 1867 was 15 in. less than that of 1866.

XVII.

COLDSTONE.—I have had a gauge placed at Blelesh three-quarters of a mile from the position of the one I use, and that distance further from the neighbouring hills. My object was twofold:—1st, to ascertain the influence of neighbouring hills on the rainfall of a district; and 2nd, the local nature of summer rainfall. The observations of one summer may not be of much value; but, so far as they go, they bring out the fact that the vicinity of hills increases the rainfall. The increase was most noticeable in the months of April, May, June, and July. In August, the partial and local nature of summer showers was very marked: while in the course of an afternoon, 2·4 in. fell here,

at three-quarters of a mile distant ·12 inches was the whole amount for the same time.

TILLYDESK.—The great excess of rain in March and April, with the continued coldness and wetness of the season throughout, rendered the crop later than it has been in any year since 1838, and, in many districts, than it has been since 1816. The year is remarkable for the extraordinary depth of rain and snow, and for the fact that November was the driest month.

XVIII.

ARDROSS CASTLE stands in the centre of high hills, and often the low current is quite different from the carry of the clouds. We have more rain, in general, than they have in the low country. This year has been very cold; the ther. only rose to temperate on 15 days prior to the 1st of June, and we had frost on the 8th. July was cold—thunderstorm on 12th; August was the warmest month—the hottest day was the 13th = 73°; fruit did not ripen well out of doors. This has been a very late year; we have 0·82 more rain than in 1866.

WATERNISH.—It would be very desirable to have gauges in some part of the outer Hebrides, to see what rain falls there nearer the Atlantic; but, I suspect that the clouds evaporated from it, pass over there to some extent, until drawn down by the higher hills in some parts of Skye. In this district there are no high hills; near Portree they are very lofty.

XIX.

MELSETTER is situated on the southern part of Hoy Island, opposite, and 9 miles distance from Dunnet Head, Caithness. The sea is distant about 300 yards from the lawn on which the gauge is placed (30 yards from any building); and there are no high hills in the neighbourhood, as at Greamsay (Hoy) Light House.

XX.

GLENAM, CLONMEL. — A curious coincidence that the rainfall of 1866 and 1867 should be exactly the same at this place; but there were much fewer rainy days.

XXIII.

LETTERKENNY.—The mean temp. here of the year at 8 a.m. seems to be about 50°.

SYNOPSIS OF RAINFALL IN THE MONTHS OF 1867, AND IN THE WHOLE YEAR.

JANUARY.

Rainfall generally rather above the average, especially in parts of Wales and the South-West of England. In Ireland and the West of Scotland the fall was deficient. Remarkable for excessively severe frosts.

FEBRUARY.

A mild, damp month, but without excessive rain; a rather heavy gale on 6th. Rain somewhat above the average at Westerly and Southern stations, and below it at North-Eastern ones. The driest month in the year at Whitby.

MARCH.

A cold unseasonable month, frequent snow, and constant N.E. wind. Rainfall above the average in the South, and below it in the North.

APRIL.

Another damp, cold, and ungenial month.

MAY.

Rain near the average, temperature above it. The month principally noteworthy for remarkable extremes of temperature; rising to 80° or 85° about the 7th, and falling several degrees below freezing point, with thick snow, on 22nd to 25th.

JUNE.

Rainfall below the average, except in the North-West of Scotland, and at those places in Kent and Sussex visited by the heavy thunder-storm on the 2nd. On the 27th the air was excessively dry; at Camden Town, at 3 p.m., the humidity was only 29 (saturation = 100); at Aldershott at the same hour still drier, viz., 22; while at Abington Pigotts, Royston, at the same hour it was 33.

JULY.

Rainfall generally above the average, owing to a series of heavy rains in different parts of the country between the 15th and 26th. Northerly winds prevalent, with cloud and low temperature.

AUGUST.

Rain below the average, except where excessive falls resulted from thunderstorms following the great heat (90°) on 14th.

SEPTEMBER.

Rainfall and temperature near the average; the former in excess in the North of Scotland.

OCTOBER.

Rain above the average at Western, and below it at Eastern stations. At Haverfordwest the wettest October for 20 years, and at Killaloe for 22 years. Gale on night of 26th and on 27th.

NOVEMBER.

A remarkably fine, dry month. No station had its average fall, and many had not one-third of the usual amount; barometer very high throughout.

DECEMBER.

Rainfall above the average in England, and below it in Scotland and Ireland; violent gale, with very low barometer on 1st.

THE TWELVE MONTHS

may be grouped thus:—

January, March, April, July, October	rather above the mean.	February, May, September, December	near the average.	June, August, November.	below the average.

THE YEAR 1867.

The total rainfall in the year is only remarkable for its singularly close approach to the mean of a series of years; and this not only by grouping large districts, but at individual stations. This is abundantly evident from the comparison tables on pages 74 and 75, whence it will be seen that at the majority of stations the departure from the average is less than 5 per cent., at eight individual stations *is not one per cent.*, and on the mean of all England is scarcely one-third per cent.

COMPARISON OF THE RAINFALL IN 1867 WITH PREVIOUS YEARS.

ENGLAND.

Div.	STATION.	COUNTY.	Average			Depth in 1867.	Difference from Average, 1860-5.
			1840-9.	1850-9.	1860-65.		
			in.	in.	in.	in.	in.
II.	Sittingbourne (Tong) ...	Kent	...	24·03	25·40	24·38	— 1·02
,,	Chichester	Sussex.....	29·10	26·67	29·01	28·05	— ·96
,,	,, Chilgrove	,, ...	33·41	32·23	32·77	29·48	— 3·29
,,	,, W. Dean	,, ...	...	35·30	37·02	32·88	— 4·14
III.	Hemelhempstead	Herts	25·86	26·43	25·47	25·84	+ ·37
,,	Berkhempstead	,, ...	...	28·05	28·02	28·73	+ ·71
,,	Oxford.....	Oxford.....	23·55	22·24	21·26	21·52	+ ·26
,,	Althorp	Northants ...	...	20·34	21·77	24·38	+ 2·61
,,	Cardington (8 in. gauge)..	Bedford	...	21·60	21·87	23·57	+ 1·70
IV.	Epping	Essex	26·99	23·18	26·05	27·10	+ 1·05
,,	Witham	,, ...	...	20·55	20·73	19·30	— 1·43
,,	Thwaite	Suffolk	23·51	26·63	27·70	28·86	+ 1·16
,,	Norwich (Honingham) ...	Norfolk	...	25·99	23·28	24·24	+ ·96
,,	Burnham.....	,, ...	...	26·86	25·98	25·95	— ·03
V.	Baverstock	Wilts	31·09	28·69	29·57	29·87	+ ·30
,,	Exeter Institution.....	Devon	29·35	26·91	30·17	32·70	+ 2·53
,,	Honiton (Broadhembury)	,, ...	35·14	32·75	34·28	35·69	+ 1·41
,,	Helston	Cornwall	...	36·22	38·05	38·34	+ ·29
,,	Truro	,, ...	43·81	40·00	42·56	39·79	— 2·77
XI.	Guernsey.....	Channel Isds.	...	34·46	37·09	37·07	— ·02
V.	Bath (Swanswick)	Somerset.....	25·62	25·20	24·15	24·54	+ ·39
VI.	Cirencester	Gloucester ...	...	29·60	30·87	33·70	+ 2·83
,,	Burford	Shropshire ...	...	25·52	26·25	24·88	— 1·37
,,	Shiffnal (Haughton Hall)	,, ...	...	24·02	23·74	25·43	+ 1·69
,,	Orleton	Worcester ...	28·41	28·82	30·06	29·29	— ·77
VII.	Wigston	Leicester.....	...	26·39	26·49	24·91	— 1·58
,,	Boston...	Lincoln	24·48	20·55	21·72	25·25	+ 3·53
,,	Welbeck	Notts	25·44	23·29	24·02	26·39	+ 2·37
,,	Derby	Derby	...	23·98	25·14	29·37	+ 4·23
VIII.	Bolton (The Folds).....	Lancashire ...	46·46	44·01	48·33	45·27	— 3·06
,,	,, (Belmont)	,, ...	...	51·19	55·70	52·20	— 3·50
,,	Preston (Howick)	,, ...	...	34·28	38·09	32·65	— 5·44
,,	Coniston	,, ...	74·42	71·40	86·00	82·61	— 3·39
IX.	Redmires...	Yorkshire ...	40·75	37·86	37·89	38·85	+ ·96
,,	Leeds (Holbeck W. W.)..	,, ...	...	23·31	22·63	26·02	+ 3·39
,,	,, (Eccup).....	,, ...	...	24·98	24·69	25·70	+ 1·01
,,	York	,, ...	25·42	22·02	23·38	25·16	+ 1·78
,,	Settle	,, ...	43·41	35·55	39·77	35·26	— 4·51
X.	Bishopwearmouth	Durham	19·94	16·91	21·16	18·40	— 2·76
,,	Seathwaite	Cumberland..	...	126·98	153·47	133·31	—20·16

COMPARISON OF THE RAINFALL IN 1867 WITH PREVIOUS YEARS.

SCOTLAND.

Div.	STATION.	COUNTY.	Average 1840-9.	Average 1850-9.	Average 1860-65.	Depth in 1867.	Difference from Average, 1860-5.
			in.	in.	in.	in.	in.
XII.	Mull of Galloway	Wigtown	20·67	22·52	28·31	26·71	— 1·60
,,	Little Ross	Kirk'udbright	...	25·27	27·35	21·65	— 5·70
XIII.	Haddington	Haddington..	23·77	24·35	26·93	27·00	+ ·07
,,	Inveresk	Edinburgh	25·81	24·72	30·05	31·11	+ 1·06
XIV.	Bothwell Castle	Lanark	...	27·76	28·33	27·66	— ·67
,,	Largs (Mansfield)	Ayr	...	43·06	48·63	44·00	— 4·63
,,	,, (Brisbane)	,,	...	46·86	53·24	50·20	— 3·04
XV.	Pladda	Bute	40·02	35·23	38·12	40·58	+ 2·46
,,	Mull of Cantyre	Argyll	45·76	41·19	44·61	46·00	+ 1·39
,,	Rhinns of Islay	,,	33·79	30·58	32·66	31·78	— ·88
,,	Castle Toward	,,	...	47·88	53·80	55·03	+ 1·23
,,	Lismore	,,	...	38·44	46·95	46·38	— ·57
XVI.	Isle of May	Fife	20·94	15·21	21·08	19·38	— 1·70
,,	Deanston	Perth	35·74	39·21	42·35	44·15	+ 1·80
,,	Stanley	,,	32·00	29·05	30·60	27·93	— 2·67
,,	Dundee (Hill Head)	Forfar	...	31·06	35·59	35·51	— ·08
,,	,, (Craigton)	,,	...	31·87	35·64	33·86	— 1·78
,,	Arbroath	,,	...	25·08	29·71	28·88	— ·83
XVII.	Aberdeen (Girdleness)	Kincardine	23·14	19·71	22·13	23·90	+ 1·77
,,	Kinnairdhead	Aberdeen	22·01	22·05	23·32	22·27	— 1·05
XVIII	Cromarty	Cromarty	...	23·67	27·80	21·43	— 6·37
,,	Barrahead	Inverness	31·60	32·67	32·62	26·81	— 5·81
XIX.	Dunnethead	Caithness	27·39	22·09	25·93	30·30	+ 4·37
,,	Pentland Skerries	,,	...	24·12	28·92	26·62	— 2·30
,,	Sandwick	Orkney	...	36·14	36·79	39·39	+ 2·60
,,	Sumburghhead	Shetland	25·43	25·22	25·52	25·42	— ·10

IRELAND.

XX.	Portlaw	Waterford	...	39·49	45·90	41·14	— 4·76
,,	Killaloe	Clare	...	38·33	46·70	46·87	+ ·17
XXI.	Black Rock	Dublin	23·20	21·78	25·83	26·11	+ ·28
XXIII	Armagh	Armagh	34·80	33·92	38·89	36·73	— 2·16
,,	Belfast (Linen Hall)	Antrim	29·44	30·13	37·12	36·77	— ·35

ABSTRACT.

England (omitting Seathwaite)	...	29·44	30·98	30·86	— ·12
Scotland	...	30·19	33·73	32·84	— ·89
Ireland	...	32·73	38·88	37·52	— 1·36
Mean of the whole	...	30·79	34·53	33·74	— ·79

MONTHLY RAINFALL IN 1867.

ENGLAND.

County ..	Kent.	Sussex.	Berks.	North-ampton.	Norfolk.	Devon.	Cornwall.	Somerset.	Worcester.
Station ..	Tunbridge.	Chichester.	Newbury.	Welling-borough.	Cossey.	Sidmouth.	St. Austell.	Burnham.	Lark Hill.
Ft. abv. Sea	71	20	235	...	...	26	300	30	157
	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	3·15	3·32	+3·56	2·23	+3·90	+5·29	+7·20	3·47	+3·69
Feb. ..	1·87	1·77	2·29	1·55	1·23	1·99	4·34	2·26	1·74
March..	2·61	3·08	2·21	2·74	1·52	4·89	5·73	+3·60	3·65
April ...	1·67	1·55	2·94	1·87	2·27	2·42	3·92	2·26	1·74
May ..	1·70	1·68	2·27	+3·01	2·87	4·40	4·40	2·36	2·00
June ...	1·62	1·95	1·61	1·24	— ·94	— ·88	1·88	1·09	1·41
July ...	+4·69	+4·03	3·06	2·89	3·03	3·93	4·05	3·22	3·59
August.	1·89	3·21	1·93	2·41	1·83	1·80	—1·29	1·81	1·91
Sept. ...	1·54	1·92	2·38	1·87	2·68	3·10	1·51	— ·92	2·86
October.	2·44	3·17	2·83	2·15	2·50	3·77	6·32	3·31	2·33
Nov. ...	— ·92	1·41	—1·11	— ·17	1·03	1·96	2·43	·99	1·28
Dec. ...	2·61	— ·96	1·34	2·00	2·99	1·91	3·32	1·64	—1·23
Totals..	26·71	28·05	27·53	24·13	26·79	36·34	46·39	26·93	27·43

	ENGLAND—(*continued.*)					WALES.			
County....	Lincoln.	Lanca-shire.	York.	York.	Cumber-land.	Cardigan.	Cardigan.	Brecknock.	Merioneth.
Station ..	Branston.	Lancaster.	Leeds.	Whitby.	Alston.	Kilgerran.	Abery-stwith.	Hay.	Bala.
Ft. abv. Sea	...	114	95	184	1416	80	50	400	544
	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	2·80	4·41	2·35	+3·98	3·80	5·40	6·14	+4·73	+7·43
Feb. ...	1·08	2·93	1·61	— ·55	4·17	3·42	2·23	2·56	5·26
March..	2·02	1·60	2·11	2·10	2·65	3·05	1·92	4·23	3·95
April ...	+2·83	3·56	3·06	2·04	+6·53	4·73	4·92	3·21	6·73
May ...	2·77	1·83	1·98	1·87	2·20	4·18	2·04	4·14	2·16
June ...	2·00	1·48	1·46	2·19	1·82	— ·48	—1·41	— ·66	— ·88
July ...	1·47	3·22	+3·14	3·26	3·91	3·25	4·12	3·21	4·39
August.	2·69	2·96	2·51	2·27	2·33	2·39	2·53	1·53	2·32
Sept.....	1·67	4·26	1·88	2·12	3·15	2·84	3·08	1·93	3·38
October	2·06	+4·61	1·98	1·68	3·50	+6·78	+7·55	4·39	6·57
Nov. ...	— ·89	—1·35	—1·23	·94	—1·40	·80	1·60	·74	1·52
Dec. ...	2·03	3·56	1·86	2·02	3·20	3·32	5·17	1·35	4·90
Totals..	24·31	35·77	25·17	25·02	38·66	40·64	42·71	32·68	49·49

MONTHLY RAINFALL IN 1867—(*continued.*)

SCOTLAND.

County.... Station ..	Kirkcudbright. Dalbeattie.	Edinburgh. Cobbinshaw.	Dumbarton. Arddaroch.	Argyll. Ardfenaig	Fife. Cupar.	Aberdeen. CastleNewe	Ross. Applecross.	Ross. Ardross Castle.	Inverness. Laggan.
Ft. abv. Sea	25?	863	80	20	130	915	50	450	1000?
	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	4·97	3·80	7·34	8·30	4·66	+5·67	2·40	+5·13	3·57
Feb. ...	3·18	3·70	8·57	7·80	1·42	1·17	5·72	3·01	4·05
March..	2·34	1·40	4·42	3·20	1·99	2·80	—1·81	2·44	1·52
April ...	4·58	4·40	+9·82	+12·30	2·65	4·19	7·64	4·45	4·84
May ...	2·39	2·40	3·56	4·10	4·14	1·99	3·05	3·30	1·85
June ...	2·06	3·20	3·38	3·08	1·73	1·44	4·17	2·58	3·20
July ...	4·60	+5·60	4·47	3·15	+5·53	4·12	1·97	3·17	3·88
August.	4·06	4·80	5·47	3·28	2·22	1·84	3·93	2·51	2·73
Sept. ...	3·26	3·00	5·51	5·39	1·71	2·56	4·64	2·78	3·19
October	+5·73	2·60	8·89	8·04	2·39	3·54	+9·08	5·08	+5·15
Nov. ...	—1·18	—1·10	—2·58	— 1·96	— ·39	— ·92	2·79	—1·51	—1·05
Dec. ...	2·81	2·60	6·49	3·91	·83	3·08	8·13	3·31	4·83
Totals..	41·16	38·60	70·50	64·51	29·66	33·32	55·33	39·27	39·86

IRELAND.

County.... Station ..	Tipperary. Clonmel.	Wexford. Courtown.	Carlow. Carlow.	Dublin. Skerries.	Galway. Cregg Park Gort.	Roscommon. Holywell.	Londonderry. Bellarena.	Cavan. Red Hills.	Antrim. Antrim.
Ft. abv. Sea	80	80	291	12	120	...	20	...	150
	in.	in.	in.	in.	in.	in.	in.	in.	in.
January	3·36	3·76	3·29	3·55	3·49	4·48	4·86	4·15	3·25
Feb. ...	2·20	2·78	3·02	2·34	4·18	2·72	3·02	2·38	2·24
March..	+5·32	5·41	3·16	3·39	3·09	2·21	2·06	2·37	1·28
April ...	3·07	2·84	2·56	2·41	3·95	3·21	3·56	+5·59	3·01
May ...	4·71	+5·46	+4·27	2·46	4·55	4·77	3·21	3·59	2·93
June ...	— ·70	·89	— ·57	1·44	1·47	2·70	1·42	1·26	—1·19
July ...	4·07	3·26	2·48	+3·58	2·31	4·11	5·23	4·54	+5·80
August.	2·85	2·34	2·05	2·88	3·31	3·67	2·48	2·72	1·97
Sept. ...	2·66	2·03	1·79	1·85	2·50	2·44	1·71	2·86	1·40
October.	4·38	2·57	3·27	3·44	+5·56	+5·78	+6·39	5·49	4·94
Nov. ...	1·01	1·69	1·66	—1·04	—1·05	— ·34	—1·13	—1·15	1·73
Dec. ...	1·41	— ·61	1·59	1·24	1·47	1·79	2·69	1·95	1·98
Totals..	35·74	33·64	29·71	29·62	36·93	38·22	37·76	38·05	31·72

MAXIMUM FALLS IN 1867.

In preparing the following list, I have adopted precisely the same course as in former years. The results, though differing slightly from those already ascertained, do so chiefly by intensifying (if I may so express it) the salient features which these tables have revealed to us in previous years. From the abstract of largest falls and largest per-centages of 1864, 1865, 1866, and 1867 (given on page 80), we obtain the following :—

Largest Falls.				Largest Per-centages.			
	Depth.	PerCent	Mean Total Fall in the year at these stations.		PerCent	Depth.	Mean Total Fall in the year at these stations.
1864 average	3·47	6·3	55	1864 average.....	9·0	2·48	27·6
1865 ,, ...	3·67	6·4	57	1865 ,, ...	9·9	2·62	26·5
1866 ,, ...	3·40	4·4	77	1866 ,, ...	8·1	2·31	28·5
1867 ,, ...	3·17	9·0	35	1867 ,, ...	11·0	2·85	25·9

By taking the average per-centages and amounts at *all* stations, we obtain the following values for the mean maximum falls :—

	Number of Stations.	Mean Per-centage.	Mean Amount.	Mean Total Fall in year.	1867 being assumed =100.	Ratio of Rainfall to the Mean.
1865	481	5·1	1·70	33	106	102
1866	590	3·7	1·48	40	129	119
1867	584	4·6	1·44	31	100	100

This class of examination is so novel that all deductions are liable to be subverted by the results of future years, but it would be unwise to suspend them for an indefinite number of years ; rather let us state what appear to be legitimate inferences, and hold ourselves at full liberty to abandon them without discredit, if they are eventually contradicted. In the first place, let us take the rules already deduced, and note against them any comments :—

RULES.	COMMENTS.
1. The greatest per-centages are at dry stations.	1. Mean yearly fall at stations of greatest per-centage ..... 27·1
2. The greatest daily falls are at wet stations, but	2. Mean yearly fall at stations of greatest fall..... 56·0 But for remarkable absence of large daily falls at wet stations in 1867, it would have been ..... 63·0
3. The wet stations never have more than 5 per cent. of their yearly fall in 24 hours, whereas	3. Perhaps 6 per cent. is nearer than 5 per cent.
4. The dry stations often have 10 per cent., and sometimes 13, 14, or 15 per cent.	4. Correct. In 1867, however, Hartlip had 16 per cent.
5. The final result, therefore, is, "that though in point of quantity the western stations maintain their excess as well in individual falls as in the yearly totals, the heavy falls *there* are relatively hardly half so large as at the eastern stations. In fact, with two or three exceptions, the classification resulting from these falls is a perfect guide to the geographical position of the stations; or, to put it in the plainest possible language, the rainfall at the western stations is more uniform in its distribution than at the eastern ones, where the fall is, so to speak, more spasmodic."	5. Correct.

Another result of these tables is, that at stations with a mean fall of 30 inches, the greatest daily fall in *each* year will probably be about 1·5 in. (see also p. 80), and once or twice in a century it will be 4 in. in 24 hours. The last result is deduced from the following rule:—

The extreme per-centage of the mean annual rainfall which may be expected on any one day is, with a mean fall of 20 inches, 16 per cent.; the per-centage decreases 1 per cent. for each additional 4 inches of mean fall, until it falls to 6 per cent., and above that point (60 in.) it is constant at 6 per cent., whatever the mean fall may be.

Examples.	Mean Fall.	Per-Centage.	Computed Max.	Observed.
Retford ...	22 in.	15·5	3·41	3·10
St. Agnes..	42 ,,	10·5	4·41	4·00
Seathwaite.	140 ,,	6·0	8·40	6·62

The result of this rule is that there is no part of the British Isles where a fall of from 3 to 4 inches of rain in 24 hours will not occur, sooner or later. Wherefore observers are requested to ascertain the capacity of their rain gauges, and if they find it three inches or under, to provide themselves with one of larger storage.

In an entirely different manner some equally interesting results may be obtained from these tables, especially with reference to heavy rains. For instance, take the entries on May 10: they are confined to a radius of 50 miles round the Wash, the per-centages are irregularly distributed, but on the whole decrease N.E. and S.W. of a line from Biggleswade to the sea. Reference to the Meteorology of the Month (page 59) will show that it resulted from a thunderstorm, the area of which must have been over 2,500 square miles. The mean rainfall at 25 stations was 1·4 inches, we shall therefore be under the mark if we take the average as 1·25, which would give 203 million tons weight of water as the minimum product of that storm. This, however, is by no means an extreme case; the actual weight of water annually deposited on the British Isles being probably not less than 250,000,000,000 tons. Surely (as Sir W. Armstrong pointed out) the English by no means fully avail themselves of the enormous mechanical power provided by the ceaseless course of these millions of tons from the mountain to the ocean whence they came.

It may be considered strange that I have not dwelt upon the heavy rainfall in the night of July 25-26th, but I have a great objection to repeating myself, and the result of careful examination of the additional data in the following tables is simply confirmatory of the map and account already given.*

ABSTRACT.

Largest Falls.				Largest Per-centages.			
Date.	Station.	Inches	Per Cent.	Date.	Station.	Per Cent.	Inches.
July 26..	Hartlip	4·78	16	July 26..	Hartlip	16	4·78
,, ,,	Deptford	3·98	14	,, ,,	Deptford Creek ...	14	3·98
April 14.	Seathwaite	3·56	3	,, ,,	Crossness.....	12	3·30
July 14..	Kettins	3·36	10	,, 24..	Sunnyside	12	2·66
,, 26..	Crossness	3·30	12	Jan. 9..	Tynemouth.....	12	2·80
,, 14..	Early Bank.....	3·19	6	May 10..	Biggleswade	11	2·50
May 25..	Bann Res.	3·10	6	July 26..	Croydon	11	2·69
Sept. 29..	Inverinate Ho.....	3·00	5	Aug. 15..	Thicket Priory ...	11	2·62
July 26..	Beech Hill	2·94	9	June 2..	Acol.....	10	2·24
,, 22..	Newmains	2·90	7	July 14..	Rosemount	10	2·77
,, 23..	Leckpatrick	2·90	6	,, ,,	Kettins	10	3·36
Jan. 9..	Tynemouth.....	2·80	12	,, 24..	Smeaton	10	2·47
July 14..	Rosemount...	2·77	10	,, 25..	Sheerness	10	2·38
Jan. 24..	Blair	2·72	5	,, 26..	Rochford.....	10	2·30
July 26..	Croydon	2·69	11	,, ,,	Strood	9	2·50
,, 24..	Sunnyside	2·66	12	,, 25,.	Bromley	9	2·30
	Mean	3·17	9.0		Mean	11·0	2·85

* *Symons's Meteorological Magazine*, Vol. II., pages 74 to 82.

Date.	Div.	Station.	Depth.	Per cent. of Annual Fall.
		JANUARY.		
1	II.	Shirley Warren.....	1·16	4
5	,,	Carbury	·87	3
,,	,,	Ryde	1·33	4
,,	V.	Chalbury	1·00	3
,,	,,	Tavistock	1·62	4
,,	,,	Bovey Tracey	1·68	4
,,	,,	Brampford Speke..	1·68	5
,,	,,	Broadhembury.....	1·14	3
,,	,,	Helston	1·44	4
,,	,,	Truro	2·02	5
,,	,,	Penarth	2·18	5
,,	,,	Bodmin	1·97	4
,,	,,	,, (A. Hambly)	1·82	4
,,	,,	New Quay.....	1·80	5
,,	,,	Liskeard	1·97	4
,,	,,	Llanteglos	2·00	4
,,	,,	S. Petherton.....	·93	4
,,	,,	Taunton Col. Sch...	1·01	3
,,	,,	Shaftesbury	·94	3
,,	,,	Long Sutton	·88	3
,,	,,	Broomfield	1·23	3
,,	XX.	Glenam	2·10	5
,,	,,	Carrick-on-Suir ...	1·90	5
,,	,,	Woodfoot	1·51	4
,,	XXI.	Monkstown	1·70	6
6	II.	Osborne	1·40	5
,,	,,	Fernhurst	1·02	3
,,	V.	Strath Culm Ho ...	1·80	6
,,	,,	Tiverton Springfield	1·08	3
,,	,,	Ilchester	1·07	4
,,	VI.	Norton-in-Hales ...	·94	4
,,	,,	Weston-u.-Lizzard	1·46	6
,,	,,	Lark Hill	1·10	4
,,	XI.	Penrhyn Quarries...	2·30	4
,,	,,	Plas Brereton	1·09	3
,,	,,	Bethesda	1·81	3
,,	,,	Pen y Maes	1·09	3
,,	,,	Abercarn	1·79	4
,,	,,	Blaina	1·33	3
,,	,,	Sirhowy	2·05	4
,,	,,	Rhydwen	1·46	3
,,	XX.	Cork	1·31	4
,,	XXI.	Woodstock	1·62	5
,,	,,	Gowran Castle	1·50	5
7	II.	WelfordPkNewbury	·80	3
,,	V.	Dinder	1·47	4
,,	,,	Altarnum	1·87	3
,,	VI.	Keynsham Bank ..	·91	4
,,	X.	Greta Bk., Keswick	1·58	3
,,	,,	Appleby.....	1·10	3
,,	XI.	Glyn Padarn	2·50	4
,,	,,	Clynnog.....	1·19	3
,,	,,	Cilgwyn.....	·70	2
,,	,,	Llanberis	2·07	3
7	XI.	Llanfrechfa	1·20	3
,,	XIX.	Roeberry	·86	3
,,	XXIII	Queen's Coll. Belfast	1·19	4
8	V.	Fulland's, Taunton	·91	3
,,	VI.	Rocklands.....	1·44	4
,,	VIII.	Plymouth Grove ...	·99	3
,,	XI.	Merthyr Tydvil ...	1·49	3
,,	XVIII	Ardross Castle	1·77	5
9	IX.	Middlesborough ...	·69	4
,,	X.	Tynemouth	2·80	12 ?
,,	XVIII	Invergordon Castle.	1·55	6
10	X.	Bywell	·90	3
,,	,,	Brenckburn	1·60	5
,,	,,	Wylam, Northum.	1·21	5
15	,,	N. Sunderland	·70	3
22	,,	Parkend	·85	3
24	XIV.	Blair	2·72	5
,,	X.	Kendal	1·54	3
,,	,,	Wood, Windermere	2·01	3
,,	XI.	Llangybi	1·15	2
25	X.	Hawick	2·06	8
27	,,	Silloth	·68	3
,,	,,	How, Windermere..	2·16	3
29	XI.	Rhiwbryfdir	2·35	2
30	IV.	Bexwell	1·07	5
,,	V.	Weston-super-Mare	1·80	7
		FEBRUARY.		
3	XII.	Glencairn	1·50	3
,,	,,	Wanlockhead	1·78	3
6	IX.	Dunford Bridge ...	1·69	3
,,	XXIII	Armagh	1·09	3
7	X.	H. Close Loughrigg	1·95	3
14	XIX.	Invershin	·73	2
		MARCH.		
8	X.	Wolsingham	1·01	3
9	II.	Canterbury	·90	4
11	V.	Northam Vicarage	·88	3
13	,,	Trevarna	1·28	3
,,	,,	Budleigh Salterton	1·80	5
,,	,,	Torquay.....	1·60	4
,,	,,	Brixham	1·96	5
,,	,,	Fore St. Hill Kings.	2·42	5
15	,,	Newton Abbot	2·17	6
21	,,	Bath	1·09	4
,,	,,	Exeter	1·01	3
,,	VI.	Northleach	1·57	5
22	XI.	Chepstow	2·05	6
23	V.	Wellington	1·08	5
,,	,,	Bridport.....	1·24	4
,,	,,	Gillingham	1·00	4
,,	VI.	Leominster	·82	3
,,	,,	Hereford	·89	3
,,	X.	Great Strickland ..	1·07	3

Date.	Div.	Station.	Depth.	Per cent. of Annual Fall.
23	XVII.	Braemar	·90	3
,,	,,	Ballater	1·49	4
24	VI.	Broomy Hill	·91	4
25	XI.	Ebbw Vale	1·84	3
,,	XXI.	Fenagh	1·21	4
		APRIL.		
13	X.	Higham	·80	2
,,	XI.	Bala	1·85	4
,,	,,	Bettws y coed	1·97	3
14	X.	Seathwaite	3·56	3
,,	XI.	Haverfordwest	2·60	5
19	IX.	Woodlands	1·16	3
20	,,	Hull, M. H. St.	·67	3
,,	,,	Beverley Road	·77	3
,,	,,	Braithwaite	1·32	3
,,	,,	Thornton-in-Craven	1·31	4
,,	,,	Bradford	1·25	5
21	,,	Shipley	1·31	4
,,	,,	Beadlam Grange	2·45	9
,,	,,	Stansfield Hall	1·11	3
23	XXIII	Red Hills	1·30	3
24	V.	Weston	·76	2
,,	,,	Batheaston	1·12	4
,,	VII.	Stubton	·96	4
,,	XVIII	Lewis Castle	1·27	4
26	XII.	N. Balfern	1·07	3
		MAY.		
9	III.	N. Brink, Wisbech	1·56	6
10	,,	Stevenage	1·32	5
,,	,,	Hitchin	1·13	4
,,	,,	Fulbourne	2·02	8
,,	,,	Beech Ho, Cambge.	1·10	5
,,	,,	Cambridge	1·15	5
,,	,,	Waresley	1·17	5
,,	,,	Wistow	1·60	8
,,	,,	Conington Castle	1·41	6
,,	,,	Stanground, Ptboro'	·81	4
,,	,,	Biggleswade	2·50	11
,,	,,	Sutton Park	1·66	7
,,	,,	Cardington	1·03	5
,,	,,	Abington Pigotts	1·90	7
,,	,,	Wisbech	1·62	6
,,	IV.	Hillington	1·05	4
,,	,,	West Tofts	1·92	8
,,	,,	Wells next Sea	1·18	5
,,	,,	Hunstanton	1·86	9
,,	,,	Swaffham	1·80	6
,,	VI.	Leamington	·82	3
,,	VII.	Waltham Rectory	·96	4
,,	,,	Belvoir Castle	1·02	4
,,	,,	Greetham	1·51	6
,,	,,	Wytham-on-Hill	1·20	6
,,	,,	Boston	1·57	6
11	VII.	Welton-le-Marsh	1·43	5
,,	X.	N. Shields	·83	4
,,	XVI.	Burntisland	1·40	5
,,	XVII.	Aberdeen(Skene St.)	1·15	4
12	II.	Chartham	1·00	5
,,	IV.	Norwich	1·22	5
,,	,,	Thorpe	1·38	5
,,	,,	Yaxley Vicarage	1·24	5
,,	,,	Geldeston	1·05	5
,,	,,	Birch Hall, Colches.	1·63	7
,,	,,	Tendring Hl Suffolk	1·40	6
,,	,,	Acle	1·13	5
,,	,,	Cossey	1·13	4
,,	,,	Grundisburgh	1·40	6
,,	,,	St. Peters, Ipswich	1·64	7
,,	,,	Mattishall	1·17	4
,,	V.	Sidmouth	1·65	5
,,	,,	Belgrave	1·70	5
,,	VI.	Monkmoor	·64	3
,,	XXI.	Coollatine Park	1·04	3
13	IV.	Somerleyton Rec.	1·21	5
,,	,,	Carlton Hall	1·15	5
,,	,,	Brooms Hill, Col.	1·70	6
20	III.	Fielde's Weir	1·47	6
,,	,,	Hatfield	1·90	7
,,	,,	Gorhambury	1·30	5
,,	,,	Nash Mills	1·70	7
,,	,,	Bayfordbury	1·44	6
,,	,,	Kensworth	1·13	4
,,	,,	Potterspury	1·86	7
,,	,,	Oxford, R. Obs.	1·08	4
,,	,,	Ampthill	1·23	5
,,	V.	Pen Hill	1·20	4
24	XXI.	Courtown	1·15	4
25	V.	Wiveliscombe	1·04	3
,,	XXIII	Bann	3·10	6
26	XVI.	Balfour	1·30	4
,,	XXI.	Reclaimed Lands	1·20	4
29	VI.	Ludlow	·70	2
		JUNE.		
2	II.	Worthing	2·08	8
,,	,,	Tunbridge Wells	1·43	5
,,	,,	Newport, I.W.	1·24	4
,,	,,	Acol	2·24	10
,,	,,	Yapton	1·10	4
,,	,,	Dale Park	1·21	4
,,	,,	Uckfield	1·47	5
,,	,,	East Grinstead	1·31	4
,,	,,	Tunbridge	1·02	4
,,	,,	Buxted Park	1·45	5
,,	VI.	Evesham	1·58	6
3	,,	Fairford	1·16	4
,,	,,	Radford Ho, Coven.	1·24	4
,,	VII.	Southwell	1·31	6

Date.	Div.	Station.	Depth.	Per cent. of Annual Fall.
3	XVI.	Trinity Gask	2·24	7
4	VII.	Beeston Meadow	1·20	5
6	VI.	Montpelier	·93	3
10	VIII.	Friesland	1·60	3
19	X.	Hendon Hill	1·60	7
		JULY.		
1	V.	St. Agnes	1·97	5
,,	VI.	Dursley Manor	·93	4
,,	VIII.	Macclesfield	·89	3
,,	,,	Kingsley	·97	3
2	,,	Macclesfield	1·38	4
3	IX.	Scarborough	1·16	4
4	III.	Stratton Audley Pk.	1·32	5
5	VI.	Worcester	1·20	5
10	VIII.	Royton	1·72	4
,,	,,	Strines Dale	2·29	6
,,	X.	Allenheads	1·44	3
11	II.	Arle Bury	·98	3
,,	XX.	Cordangan Manor	1·58	5
,,	XXI.	Birr Castle	2·06	7
,,	XXII.	Holywell	1·37	4
,,	XXIII	Owendoon	1·25	2
12	XXI.	Cangort Park	·89	3
13	V.	Castle Hill	1·23	3
,,	VI.	Wolver'n. Oaklands	1·17	5
,,	,,	Stretton Rectory	1·25	5
,,	,,	Haughton Hall	·78	3
,,	VIII.	Rufford	1·10	4
,,	IX.	Doncaster	2·22	7
,,	X.	Carlisle Cemetery	·80	4
,,	XII.	Dalbeattie	1·07	3
,,	XVI.	Dundee	1·50	5
,,	XXI.	Portarlington	·81	3
,,	XXII.	Galway	1·49	3
14	V.	Pentillie	2·15	4
,,	VI.	Church Aston	·74	3
,,	VII.	Welbeck Abbey	1·30	5
,,	,,	Notting. Arboretum	1·29	4
,,	VIII.	Heaton	1·73	4
,,	XVI.	Early Bank	3·19	6
,,	,,	Rosemount	2·77	10
,,	,,	Barry Village	2·08	7
,,	,,	Kettins	3·36	10
,,	,,	Arbroath	1·56	6
,,	,,	Nookton	1·77	6
15	II.	Petworth	1·16	4
,,	III.	Banbury	1·39	5
,,	VI.	Henley-in-Arden	·93	4
,,	,,	Barlaston	1·21	4
,,	,,	Wolver'n. Wloo. Rd.	·88	3
,,	,,	Woolstaston	1·02	3
,,	VIII.	Wallasea	1·01	4
,,	,,	Allithwaite	1·01	3
,,	,,	Ulverstone	1·40	3
15	VIII.	Holker Gardens	1·35	3
,,	XI.	The Ham	1·29	4
,,	,,	Portmadoc	1·59	3
,,	,,	Gwersylt Hill	1·07	4
,,	,,	Llanfairfechan	1·80	5
,,	,,	Menaifron	1·09	3
,,	,,	Llanfairynghornwy.	1·14	3
,,	,,	Aberdaron	1·21	3
,,	,,	Bodfaen	1·03	3
,,	XVI.	Scone Palace	1·50	6
,,	XVII.	New Pitsligo	·91	2
,,	XXI.	Dublin, O.S.O.	·95	4
,,	,,	Dublin	1·26	5
,,	,,	Skerries	1·58	5
,,	,,	Black Rock	1·77	7
,,	XXIII	Antrim	·90	3
,,	,,	Waringstown	1·30	4
,,	,,	Banbridge	1·27	4
16	V.	Upwey	1·40	5
,,	VI.	Knypersley	·90	3
,,	VIII.	Lancaster South Rd.	1·00	3
,,	,,	Brushes Clough	1·29	3
,,	,,	Stockport	·94	4
,,	XXIII	Belfast, Linen Hall	1·08	3
,,	,,	Ballymoney	1·64	4
,,	,,	Moneydig	1·55	4
17	VIII.	Caton	1·04	3
,,	,,	Belmont	2·10	4
,,	,,	Blackburn	1·69	4
,,	XI.	Llandudno	1·16	4
,,	XXIII	Belfast	1·40	3
,,	,,	Bellarena	1·47	4
18	X.	Low Lights	·86	4
,,	,,	Otterburn	1·07	3
21	,,	Derwent Island	1·24	2
22	,,	Keswick	2·25	5
,,	XII.	Wooplaw	2·47	7
,,	,,	Silverbut Hall	1·92	7
,,	,,	Galashiels	2·20	7
,,	XIII.	Millerfield Ho Edin.	2·14	7
,,	,,	Lyne	2·20	7
,,	,,	North Esk. Res.	2·30	7
,,	,,	Thirlestane Castle	2·20	8
,,	,,	Mungo's Walls	2·15	8
,,	XIV.	New Cumnock	1·49	3
,,	,,	Wilsonstown	1·65	4
,,	,,	Newmains	2·90	7
,,	,,	Lanark	1·48	5
,,	,,	Bothwell Castle	1·50	5
,,	,,	Baillieston	1·66	4
,,	XXII.	Markree	1·02	2
,,	,,	Hazlewood	1·37	3
23	X.	Wallington	1·14	4
,,	,,	Bishop Wearmouth	1·02	6
,,	XII.	Dumfries	1·35	4

Date.	Div.	Station.	Depth.	Per cent. of Annual Fall.
23	XIV.	Coatbridge	1·52	5
,,	,,	Hillend House	1·03	3
,,	,,	Auchendrane.....	1·91	4
,,	XXII.	Mount Shannon ...	1·91	4
,,	XXIII	Leckpatrick	2·90	6
,,	,,	Londonderry.....	2·15	5
24	XII.	Kelso	1·19	6
,,	,,	Warmanbie	1·60	5
,,	,,	Sunnyside	2·66	12
,,	XIII.	Smeaton.....	2·47	10
25	I.	Holloway	1·85	7
,,	,,	Harrow	2·10	8
,,	,,	Teddington	1·44	6
,,	,,	Chiswick	1·48	7
,,	,,	Dorset Square	1·85	7
,,	,,	Camden Road	1·82	7
,,	,,	Islington	1·89	7
,,	,,	Highgate	1·90	7
,,	,,	Mill Hill	1·89	7
,,	,,	Southgate	1·82	6
,,	II.	Bromley..... ..	2·30	9
,,	,,	Sevenoaks	1·36	4
,,	,,	Oakhurst	1·02	3
,,	,,	Cookham	1·12	5
,,	,,	Goudhurst.....	·95	4
,,	,,	Cobham.....	1·65	7
,,	,,	Selling	1·40	6
,,	,,	Dorking	2·30	7
,,	,,	Chobham	1·19	5
,,	,,	Croydon	1·91	8
,,	,,	Wimbledon	1·28	5
,,	,,	Brixton Hill	2·00	7
,,	,,	Kew	1·32	6
,,	,,	Strathfield Turgiss	1·10	4
,,	,,	Windsor	·95	4
,,	,,	Selborne	·95	3
,,	,,	Alton.....	1·03	3
,,	,,	Wainsford.....	·83	3
,,	,,	Hythe	1·24	4
,,	,,	,, Horton P....	1·43	5
,,	,,	Cranbrook.....	1·07	4
,,	,,	Tillsden.....	1·25	4
,,	,,	N. Falconhurst ...	1·09	4
,,	,,	East Peckham	1·20	5
,,	,,	Brogdale	1·45	7
,,	,,	Tong	1·44	6
,,	,,	Sheerness	2·38	10
,,	,,	Beckenham	2·46	9
,,	,,	Hollington	1·02	3
,,	,,	Forest Lodge	1·12	4
,,	III.	Eton	·93	4
,,	,,	Berkhampstead.....	1·08	4
,,	IV.	Shoeburyness	1·72	8
,,	,,	Billericay	2·25	8
26	I.	Twickenham.....	1·45	7
26	I.	Hampton Wick ...	1·29	5
,,	,,	Staines	1·30	5
,,	,,	Spring Gardens ...	2·22	9
,,	,,	Mile End	1·20	5
,,	,,	Potter's Bar	2·20	8
,,	II.	Croydon.....	2·69	11
,,	,,	WandsworthW.Hill	2·19	9
,,	,,	Linton Park.....	1·51	6
,,	,,	Hartlip	4·78	16
,,	,,	Strood	2·50	9
,,	,,	Deptford Creek.....	3·98	14
,,	,,	Crossness	3·30	12
,,	,,	Ketches	1·21	4
,,	,,	Englefield	·91	4
,,	,,	Long Wittenham...	1·20	4
,,	III.	Stretham, Ely	1·30	6
,,	IV.	Fennes	1·63	7
,,	,,	Rochford	2·30	10
,,	,,	Reepham	1·22	5
,,	,,	Outwell	1·26	6
,,	,,	Aldham	2·15	8
,,	,,	Burnham	1·27	5
,,	,,	Bury St. Edmunds	2·50	9
,,	,,	Beech Hill	2·94	9
,,	,,	Barton	1·76	7
,,	,,	Culford	2·07	8
,,	,,	Ixworth.....	2·60	9
,,	XX.	Portlaw	1·50	4
27	IV.	Westley...	2·07	8
,,	,,	Egmere	1·57	5
,,	,,	Hedingham Castle	1·02	5
		AUGUST.		
2	III.	Tetworth Hall	1·03	4
5	II.	West Dean	1·06	3
7	VII.	Louth	·86	3
,,	XII.	New Galloway	1·13	2
15	III.	Thorpelands	1·25	5
,,	,,	Althorp	1·38	6
,,	V.	Trowbridge	1·21	4
,,	,,	Tytherton	1·25	5
,,	VI.	Pailton House	1·17	4
,,	,,	Rugby	2·28	8
,,	,,	Cirencester	1·05	3
,,	VII.	Dalby Hall	1·65	7
,,	,,	Heydour Vicarage	1·14	5
,,	,,	Belmont House .	1·23	5
,,	,,	Chatsworth	1·75	5
,,	,,	Knaptoft Hall	2·00	8
,,	,,	Stretton Fields.....	1·17	4
,,	,,	Loddington Hall ...	1·31	5
,,	,,	Owston	1·10	4
,,	,,	Stony Middleton ...	1·66	5
,,	IX.	Holbeck	1·35	6
,,	,,	Barnsley	1·46	6

Date.	Div.	Station.	Depth.	Per cent. of Annual Fall
15	IX.	Westwood Hall ...	1·62	6
,,	,,	Thicket Priory.....	2·62	11
,,	,,	Pocklington	1·49	5
,,	,,	Dalton Huddersfield	1·09	4
,,	,,	Goole	1·83	6
,,	,,	Whitby	1·11	4
,,	,,	Tickhill.....	1·31	5
,,	,,	Nortonthorpe	1·33	4
,,	X.	Durham.....	·96	5
,,	,,	Eaglescliffe Rectory	1·44	6
,,	,,	Dinsdale	1·90	7
,,	,,	Ushaw	·99	4
,,	,,	Seaham Hall.....	1·22	5
16	V.	Chiltern Ho	·94	3
,,	VII.	Wigston.....	1·24	5
,,	,,	Grantham	1·08	4
,,	IX.	Queensbury	1·58	4
,,	,,	The Knoll.....	1·01	4
,,	,,	Mirfield.....	1·88	7
,,	,,	Holme-on-S. Moor.	1·79	7
,,	,,	Harrogate	2·05	7
,,	,,	Wellhead	1·16	3
,,	X.	The Hall, Sunderld.	·94	4
17	VIII.	Garstang	1·09	3
,,	X.	Whelprigg.....	1·21	3
18	VIII.	Bay V. Grange... ..	1·12	3
,,	IX.	Sedbergh	1·61	3
19	VI.	Burton-on-Trent ...	1·05	5
,,	VII.	St. Thomas Rectory	2·16	7
,,	,,	Duffield	2·34	8
,,	,,	Derby	2·11	7
,,	,,	Brampton	2·02	6
,,	,,	West Hallam	1·39	5
,,	IX.	York	1·18	5
,,	,,	Moorgate Grove ...	1·85	7
,,	,,	Masborough	1·51	6
20	II.	Thorney Island ..	1·25	5
,,	VII.	Belper	2·23	7
,,	,,	Doveridge	·89	4
,,	,,	Willersley.....	1·74	5
,,	IX.	High Hazles.....	1·45	5
,,	,,	Cottingham	·94	4
,,	XVI.	West Grange.....	1·00	5
,,	XVIII	Beaufort Castle.....	1·62	5
,,	,,	Inverness	1·20	4
,,	,,	Fearn.....	1·79	7
,,	,,	Laggan	1·30	3
21	XVI.	Deanston Ho.....	1·35	3
,,	XVIII	Dingwall	1·22	4
		SEPTEMBER.		
1	VIII.	Ardwick	1·31	4
2	II.	Fornham	·98	4
,,	IV.	Honingham	1·05	4
,,	V.	Mildenhall	1·00	3
2	V.	Bath R. Institution	·95	3
,,	,,	Draycott	1·15	4
3	II.	Shirley Warren ...	1·02	3
,,	,,	Reading.....	1·00	4
,,	,,	Strathfieldsaye	1·30	5
,,	III.	Granchester Mills...	1·07	5
,,	VI.	Great Malvern	1·17	4
,,	,,	Stanley	·68	2
,,	VII.	Killingholme	·85	4
,,	,,	Ruddington Grange	1·03	4
,,	,,	Belton	1·25	5
,,	IX.	Longwood..... ..	·93	3
,,	X.	Whinfell Hall	1·22	3
4	IX.	Patrington	1·19	5
6	X.	Penrith	1·10	4
7	XI.	Llanelly.....	1·20	3
8	III.	Much Hadham	1·22	5
9	II.	Glynde Place.....	1·19	4
,,	,,	Cadland.....	·92	3
,,	,,	Otterbourne	1·58	6
,,	,,	Petersfield..... ..	1·42	4
,,	,,	Liss	1·46	5
,,	IV.	Audley End	1·00	4
,,	,,	Wimbish	1·21	5
10	II.	O. S. O. Southmpn.	1·95	6
,,	,,	Leigh Park	·93	3
,,	XIX.	Sandwick	1·60	4
,,	,,	Papa Westray	1·05	3
12	II.	Reading.....	1·00	4
,,	XX.	Valentia	1·32	2
14	VI.	Wincle	·98	3
,,	VIII.	Hornby Castle	1·63	4
,,	,,	Yealand.....	1·52	4
,,	X.	Casterton	1·50	3
,,	,,	Whitbeck	1·15	4
,,	,,	Bootle Rectory	·92	2
29	XV.	Callton Mor	1·06	2
,,	,,	Ardfenaig	2·61	6
,,	XVIII	Inverinate.....	3·00	5
,,	,,	Glen Strathfarrer...	2·29	4
		OCTOBER.		
9	V.	Treharrock Ho	1·32	3
,,	,,	Roscarrock	1·15	3
,,	XI.	Talarvor	·96	3
14	V.	Buckish.....	1·29	3
,,	XI.	Llanstephane	1·56	4
15	II.	Pevensey	·96	4
,,	,,	Hunton Court	1·04	4
,,	IV.	Sheering Rectory...	·81	4
,,	,,	High Roding.....	·90	4
,,	XII.	Crichton Inst.	1·00	3
22	XXII.	Cregg Park	1·12	3
23	XX.	Ballykisteen	·85	2
25	XII.	Carsphairn	1·44	3

Date.	Div.	Station.	Depth.	Per cent. of Annual Fall.
26	XII.	Waterside	1·19	2
,,	XV.	Bloomhill	1·90	3
,,	,,	Stuckgown	2·00	2
,,	XVI.	Muthill	1·61	3
,,	XVIII	Lochbroom	2·25	4
,,	XIX.	Pulteney Ho.....	1·15	4
27	X.	Mirehouse	1·03	2
,,	XIV.	Ferguslie	1·40	4
,,	,,	Gourock.....	2·48	4
,,	XVIII	Applecross	2·50	5
,,	XIX.	Helmsdale.....	1·50	4
28	X.	Low Nook.....	1·45	2
29	,,	Stainburn	·77	2
,,	,,	Tarn Bank.....	·73	3
,,	XX.	Ballinlonty	1·30	4
		NOVEMBER.		
6	V.	Callington.....	1·49	3
14	VI.	Clifton S. Parade...	1·26	4
,,	,,	,, R. York Ter.	1·31	4
,,	XI.	Tintern Abbey	1·00	3
15	II.	Salehurst	·93	3
,,	VI.	Berkeley	1·15	4
16	II.	St. Lawrence.....	·96	4
17	,,	Dover.....	1·10	4
30	,,	Eastbourne	·98	3
,,	,,	Windsor(Woodside)	·92	4
,,	V.	Ham	1·90	4
,,	,,	Marlborough Col.	1·08	3
30	V.	Dorchester	1·47	4
,,	,,	Mells Rectory	1·20	3
,,	,,	Dartmoor	1·76	2
,,	,,	Calstock	1·89	3
,,	VI.	Stroud	·80	3
,,	VIII.	Eccles	1·33	4
,,	,,	Oldham	1·22	3
,,	,,	Penketh	1·30	4
,,	XI.	Cardiff	1·25	3
,,	,,	Pentyrch	1·56	3
,,	,,	Cochsidia	1·12	3
,,	XXI.	Carlow	·92	3
		DECEMBER.		
1	V.	Meshaw Rectory ...	1·46	3
,,	VIII.	Liverpool Obs.....	1·08	4
,,	,,	Heaton (H. Baylis)	1·30	3
,,	,,	Old Trafford	1·22	4
,,	XI.	Carmarthen	1·10	3
,,	,,	Cardiff (Ely)	1·18	3
,,	,,	Kilgeran	1·50	4
2	II.	R. Lodge, Maidenhd.	1·23	5
,,	V.	Swanswick	1·25	5
14	VII.	Buxton	1·83	3
,,	XI.	Aberystwith	1·00	2
15	VI.	Etruria	·90	3
,,	,,	Rudyard	·95	3
,,	XI.	Festiniog	2·30	3
,,	XV.	Camusinas	1·60	2

GENERAL TABLES

OF

TOTAL RAINFALL IN 1867,

AT ABOUT

1300 STATIONS

IN THE

BRITISH ISLES.

ARRANGEMENT OF GENERAL TABLES.

The divisions are the same as those adopted by the Registrars General of England and Scotland.

The boundaries of these divisions are shown on the map prefixed to *British Rainfall*, 1863.

The counties follow the same order as in the reports of the aforesaid officers.

An alphabetical list of the counties is given with the page or pages on which all returns from each will be found.

The stations in each county are arranged in the order of their latitude from South to North.

In order to facilitate finding the fall in any part of the country, the first name is almost always that of a place given in *Bradshaw* or the *British Postal Guide;* the second name is added occasionally, to fix accurately the site of Observation. In a very few instances, this second name is in [ ] instead of ( ); it shows the nearest town, which is then in an adjoining county.

The contents of the columns are sufficiently explained by the headings, except that in the column headed "diameter" figures will occasionally be noticed of a different type from the rest of the tables; these figures indicate the length of the sides of rectangular mouthed gauges. These measurements are all in inches.

An asterisk * denotes that the gauge was tested before erection, and a † that it has been visited and examined since. A note of interrogation (?) implies doubt, not necessarily error. ...indicates the absence of information.

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ENGLAND AND WALES.

DIVISION I.—MIDDLESEX.

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell
		Diameter.	Height Above Ground.	Height Above Sea Level	1867	
			ft. in.	feet.	inches.	
MIDDLESEX.						
Hampton Wick	T. J. Nelson, Esq.	5	1 1	27	24·17	151
Staines (Shortwood Ho.)	H. St. J. Joyner, Esq.	5	0 6	52	24·97	159
Teddington	R. D. Blackmore, Esq.	5	0 10	26	24·86	158
Twickenham Observatory	A. Wiss, Esq.	...	0 9	34	21·57	111
Chiswick	R. Thompson, Esq.	12	3 9	14	21·23	148
Hammersmith, S.W.	F. J. Burge, Esq.	...	1 0	12	23·99	179
Westminster(SpringGrdns),S.W.	J. W. Bazalgette, Esq.	8	6 8	36	23·55	120
London (Guildhall), E.C.	W. Haywood, Esq.	8	50 0	118	22·71	158
„ (Chiswell Street), E.C.	A. Slate, Esq.	5	51 0	...	19·60	104
„ (Mile End), E.	F. Charrington, Esq.	12	10 0	...	23·00	103
„ (Dorset Square,) W.	H. E. Segrave, Esq.	5	10 0	100	26·05	154
† „ (Camden Road), N.W.	G. J. Symons, Esq.	8	0 4	100	26·29	151
„ Islington(St.Mary'sRoad,N.)	W. T. Reynolds, Esq.	5	1 0	90?	25·52	167
„ (Holloway) N.	W. B. Kesteven, Esq.	5	1 3	140	27·07	178
Upper Clapton (Hadham Ho.)	J. Parnell, Esq.	...	2 5	90	24·57	...
Hampstead, N.W. (Roslyn Ho.)	C. H. Woodd, Esq.	...	1 4	303	26·10	...
„ (Squire's Mount)	Rogers Field, Esq. C.E.	5	1 0	380	28·08	160
„ (The Grove)	H. Sharpe, Jun., Esq.	5	2 0	440	28·29	...
„ „	„ „ „ „	5	50 0	470	22·79	...
† Highgate Nurseries	J. Cutbush, Esq.	5	1 0	394	27·14	135
Harrow	B. Haughton,Esq.,C.E.	5	0 10	180	26·17	131
Tottenham (Grove Ho.)	Charles Ashford, Esq.	5	3 0	60	25·10	161
Mill Hill, (Brittany House)	J. A. Hadden, Esq.	6	1 0	420	28·95	158
Enfield (Nag's Head Lane)	W. C. Mylne, Esq.	...	3 0	89	29·76	...
Southgate (Chase Bank)	S. Hughes, Esq.	5	1 2	350	27·56	167
Winchmore Hill	T. Paulin, Esq.	8	0 9	350?	26·78	160
Potters' Bar	Mrs. Kaye	3	0 8	...	28·51	123

DIVISION II.—SOUTH-EASTERN COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Rain Gauge. Height Above Ground.	Rain Gauge. Height Above Sea Level	Depth of Rain. 1867	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
SURREY.						
Godalming (Dunsfold)	W. L. Woods, Esq.	5	0 6	166	24·85	...
Farnham (Culverlands)	Miss Gibson	5	1 1	300	25·51	181
†Guildford	Capt. James, R.E.	5	1 1	120	25·65	155
Dorking (Deepdene)	Mr. Whiting	12	2 9	...	25·38	123
„ (West Street)	W. A. Marsh, Esq.	10	35 0	150 ?	30·57	138
„ (Box Hill)	E. Boorman, Esq.	8	4 0	500	26·81	...
Cobham (Pyports)	G. Dines, Esq.	8	1 1	66	24·29	175
Banstead (Down House)	F. W. Field, Esq.	...	...	...	26·84	...
Chobham	Dr. Ward	5	3 0	93	21·99	134
†Weybridge Heath	W. F. Harrison, Esq.	8	0 6	150	25·96	...
† „ (Village) *(monthly)*	„ „ „	8	0 6	53	23·43	...
Bagshot Park	Sir J. Clark, Bt., F.R.S.	5	1 1	230	23·53	...
Croydon	Dr. Westall	5	1 6	152	24·16	133
„ (Waldenhurst)	C. W. Johnson, Esq.	8	28 0	217	24·32	126
Wimbledon	T. Devas, Esq.	12	3 0	170	23·51	153
*Brixton Hill	Miss Sweeting	5	1 0	127	27·63	184
Wandsworth (South Fields)	R. Coleman, Esq.	10	1 0	...	26·71	...
„ (West Hill)	J. E. Richard, Esq.	3	0 10	86	24·39	85
†Kew Observatory	Dr. Stewart, F.R.S.	10	1 3	19	21·33	135
KENT.						
†Tenterden (Maytham Hall)	R. Appach, Esq.	8	1 2	120	30·24	169
†Hythe	H. B. Mackeson, Esq.	8	0 8	12	31·26	202
†Dover (Castle Street)	H. J. Poulter, Esq.	5	2 2	52	26·91	...
† „ (Castle Keep)	„ „ „	5	99 0	512	10·42	...
†Hythe (Horton Park)	J. Kirkpatrick, Esq.	8	1 6	350	28·38	177
†Cranbrook (Hartley)	G. Pile, Jun. Esq.	5	4 0	352	31·15	232
† „ (Tillsden)	T. Pile, Esq.	...	0 3	...	36·53	181
Goudhurst Vicarage	Rev. J. S. Clarke	5	1 1	490	24·51	166
Tunbridge Wells	Rev. F. W. Stow	5	0 6	403	30·78	176
†Tunbridge	Dr. Fielding	5	1 0	71	26·71	178
Edenbridge (New Falconhurst)	J. G. Talbot, Esq.	5	1 0	400	29·42	173
†Staplehurst (Linton Park)	Mr. J. Robson	8	0 6	296	26·71	176
† „ (East Sutton Park)	Mr. T. Skinner	8	0 6	387	26·96	...
† „ (Hunton Court)	Mr. P. Goddard	8	0 6	80	25·74	140
†East Peckham	S. T. Harris, Esq.	5	2 0	76	24·21	135
†Faversham (Brogdale)	W. C. Stunt, Esq.	5	0 7	140	22·86	151
†Canterbury (Chartham)	C. T. Drew, Esq.	8	2 6	40	21·94	148
„ (Bridge Street)	J. Reid, Esq.	5	0 10	51	25·10	177
†Maidstone (Soverfield)	F. Dobell, Esq.	20	1 0	...	27·15	...
† „ (Larkfield)	Rev. N. Dimock	5	3 6	...	26·25	...
†Seven Oaks (River Hill)	J. T. Rogers, Esq.	5	9 7	520	26·45	...
„ (Riverhead)	Rev. J. B. Murdoch	5	1 0	...	32·14	173
†Westerham (Chartwell)	J. C. Colquhoun, Esq.	5	0 6	500	32·09	...
Selling (Harefield)	E. Neame, Esq.	5	2 6	...	24·49	181
†Sittingbourne (Tong)	G. Eley, Esq.	5	2 6	2	24·38	159
* „ (Hartlip)	W. Bland, Esq.	5	2 0	159	26·84	155
†Ramsgate (Cannon Brewery)	R. Cramp, Esq.	12	7 6	78	19·37	141
†Margate (Acol)	E. S. Lendon, Esq.	5	1 0	60	23·20	...

DIVISION II.—SOUTH-EASTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which .01 or more fell.
		Diameter	Height Above Ground.	Hei ht Above Sea Level	1867	
			ft. in.	feet.	inches.	
KENT (*con*).						
West Wickham	Rev. J. T. Austen	12	1 2	380	31·83	...
Bickley	G. F. Chambers, Esq.	5	1 0	220	24·38	...
Bromley Common, S.E.	Rev. A. Rawson	8	1 3	250	26·16	149
Foot's Cray (Sidcup)	Miss Berens	5	0 8	...	24·33	...
Strood (High Street)	Mr. Sandy	5	0 9	15	27·92	153
†Sheerness Water Works	J. Lund, Esq., C.E.	5	1 0	9	22·48	148
† „ „ „	„ „	5	70 0	79	12·86	111
Lee (Blessington Road)	J. Grant, Esq.	10	4 9	49	27·58	...
† Beckenham (Parkside)	C. O. F. Cator, Esq.	8	0 3	157	26·83	160
Deptford (Pumping Station)	W. Jeffree, Esq	10	3 8	18	29·10	159
Crossness [Barking Reach]	J. Grant, Esq.	10	0 9	18	28·25	150
„ „ „	„ „	11	0 8	17	25·46	150
WEST SUSSEX.						
†Bognor (Aldwick)	H. Upton, Esq.	5	1 0	10	22·51	...
†Worthing	W. J. Harris, Esq.	5	0 9	17	26·83	155
†Arundel (Yapton)	R. Redford, Esq	5	1 0	24	28·12	143
Emsworth (West Thorney)	F. Padwick, Esq.	5	0 10	10	23·79	...
†Chichester (Infirmary=Museum)	W. Hills, Esq.	5	0 6	20	28·05	...
† „ (Westgate)	Dr. Tyacke	4	0 6	15?	26·22	...
† „ (Shopwyke)	Rev. G. H. Woods	8	1 3	61	27·93	...
†Arundel (Dale Park)	J. C. Fletcher, Esq.	11	3 0	316	33·65	128
†Chichester (West Dean)	H. Paxton, Esq.	8	1 4	250	32·88	157
† „ (Chilgrove)	W. Leyland Woods, Esq.	5	0 6	284	29·48	...
† „ (Bepton Hill)	„ „ „	5	0 6	554	35·04	...
†Petworth	Rev. C. Holland	5	1 10	170	32·11	225
Lynch [Liphook]	W. Leyland Woods, Esq	5	0 6	160?	33·82	...
†Fernhurst [Haslemere]	Miss E. A. Salvin	8	0 10	301	28·77	151
†Milland House [Liphook]	Rev. J. M. Heath	18	25 0	326	31·59	...
†Horsham (St. Leonard's Lodge)	Mr. S. Ford	5	1 6	200	29·67	...
EAST SUSSEX.						
†Eastbourne	Miss W. L. Hall	5	4 3	12	29·97	177
„	„ „ „ „	5	1 0	80	26·97	166
†Pevensey	M. Vidler, Esq.	8	4 0	10	22·70	140
†Brighton (Water Works)	Brighton Water Co.	5	1 0	90	29·38	...
†Hastings (High Wickham)	E. Field, Esq.	5	1 2	212	26·27	...
† „ (Bleak House)	Mr. J. Banks	8	1 3	80	26·08	121
† „ (Hollington)	Capt. Lewis	5	1 0	286	31·00	165
Ore (Oakhurst)	T. H. Morgan, Esq.	5	0 10	354?	29·65	188
†Lewes (Glynde)	Mr. J. McLeod	5	3 6	45?	33·48	140
†Battle	F. Webster, Esq.	5	1 3	...	33·25	...
†Uckfield	C. L. Prince, Esq.	12	6 0	149	30·48	140
† „ (Molesey Gore)	F. Brodie, Esq.	8	0 6	115	30·48	...
†Newick (Ketches)	Miss Shiffner	8	0 5	192	27·43	...
†Buxted Park	Col. Harcourt	12	7 0	200	31·43	141
†Maresfield (Rectory)	Rev. E. Turner	8	1 2	250	30·23	174
† „ (Forest Lodge)	Captain W. Noble	8	1 2	259	28·72	154
†Salehurst (Church House)	Mr. S. Boorman, Jun.	5	4 2	...	28·99	164
Cuckfield (Balcombe Place)	J. A. Hankey, Esq.	8	1 3	340	31·14	157

DIVISION II.—SOUTH-EASTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1867	Days on which ·01 or more fell.
			in. ft.	feet.	inches	
EAST SUSSEX—(*con.*)						
W. Hoathly (Pearcelands)	J. Dudgeon. Esq.	5	1 0	300 ?	30·33	136
East Grinstead	W.V.K. Stenning, Esq.	5	1 3	400?	30·85	196
HAMPSHIRE.						
† Isle of Wight (St. Lawrence) ..	Rev. C. Malden	5	1 0	75	27·24	145
† „ „ (Newport)	Mr. E. G. Aldridge ...	5	8 8	53	31·77	143
† „ „ (Ryde).....	R. Taylor, Esq.	12	7 0	20	29·56	128
† „ „ (Osborne).....	J. R. Mann, Esq.	8	0 6	172	27·68	135
Bournemouth (Woodcote).....	Rev. P. H. Newnham	5	5 0	125	26·23	...
Christchurch (Carbery)	F. Moser, Esq.	8	0 6	80?	29·53	170
Lymington (Wainsford).....	H. Fawcett, Esq.	5	1 2	82	30·83	171
Southampton (Cadland).....	A. H. Hogg, Esq.....	8	4 6	100	30·18	141
Farcham	H. Sharland, Esq.....	5	0 2	26	30·98	...
Havant (Denvilles)	Col. Paxton	10	1 2	30 ?	25·87	...
„ (Bedhampton)	J. N. Hillman, Esq. ...	5	1 0	...	24·80	148
„ (Leigh Park)	W. H. Stone, Esq. ...	8	0 8	110	31·85	137
Southampton, Ordnance Survey Office	Col. Sir H. James, R.E. F.R.S.	5 14	0 4 18 6	74 92	30·86 27·82	151 150
Southampton (Loperwood)	H. S. Pearce, Esq	8	0 4	147	29·78	158
„ (Eling House).....	W. C. Spooner, Esq....	4	1 0	30	29·57	...
„ (Shirley Warren)...	R. C. Hankinson, Esq.	5	4 0	105	28 96	167
„ „ „ ...	„ „ „	5	0 6	103	29·43	167
Winchester (Otterbourne) *daily*..	J. B. Yonge, Esq.....	5	1 3	115	29·49	169
„ „ *monthly*	„ „ „	5	1 4	115	30·42	...
Petersfield (Heath Lodge).....	Rev. H. Haigh	8	1 0	200	37·83	155
„ (Liss)	G. E. Coryton, Esq. ...	7	0 8	...	31·07	...
New Alresford (Arle Bury)	F. Marx, Esq.....	4	1 6	308	29·91	...
Selborne (The Wakes)	T. Bell, Esq.	6	4 0	400	32·73	157
Alton (Culverton Ho.)	P. Crowley, Esq.	8	3 6	334	32·91	169
Aldershot	Mr. J. Arnold	8	0 6	325	25·93	166
„ „ „	„ „ „	5	3 0	328	25·38	...
„ „ „	„ „ „	5	6 0	331	24·57	...
„ „ „	„ „ „	8	25 0	350	17·35	...
„ „ „	„ „ „	5	62 0	337	22·66	...
„ (Bourley—2 miles W.)	Sergeant Dagnall, R.E.	8	1 0	370	24·11	140
Basingstoke (Sherborne St. John)	Rev. D. W. Chute ...	5	1 2	...	27·44	147
„ (The Vyne)	W. Wiggett Chute, Esq.	8	1 2	...	27·02	...
„ „ „	„ „ „	3	0 11	...	27·99	...
Strathfield Saye	Mr. J. Bell.....	8	1 0	160?	26·21	146
„ Turgiss.....	Rev. C. H. Griffith ...	5	4 0	209	26·01	168
BERKS.						
Windsor (Cumberland Lodge) ...	Hon. Maj.-Gen. Hood	5	1 0	200	23·54	150
„ (Parkside)	W. Menzies, Esq.	...	6 0	...	22 48	...
„ (Woodside)	W. Devas, Esq.....	5	0 10	...	24·94	182
Reading (Englefield)	E. Robinson, Esq.....	5	1 0	...	25·50	147
„ (Forbury Gardens).....	Mr. Davis	5	1 3	130	25·97	119
„	Dr. Workman	5	0 8	...	23·63	143
Newbury (Welford Park).....	Mr. C. Ross	5	0 11	...	29·09	183
„ (Greenham).....	J. Ward, Esq.....	5	1 0	235	27·53	170

DIVISION II.—SOUTH-EASTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground ft.	Height Above Ground in.	Height Above Sea Level feet.	Depth of Rain. 1867 inches.	Days on which ·01 or more fell.
BERKS—(*con.*)							
Newbury (Speen)	Rev. H. W. Majendie	5	1	0	...	27·69	147
Maidenhead (White Waltham)	Mr. J. Silver	...	1	6	...	23·98	...
,, (Ray Lodge)	W. Lassell, Esq.	6	1	0	90?	25·18	108
Streatley	Rev. J. Slatter	10	0	4	150	26·52	140
Maidenhead (Cookham Vic.)	Rev. R. W. Rogers	5	1	3	60	24·03	187
,, (The Halls)	F. W. Jowers, Esq.	...	2	4	70	23·75	...
*Wantage	E. C. Davey, Esq.	5	12	8	185	24·59	135
Wallingford (The Castle)	J. Kirby Hedges, Esq.	5	0	9	175	24·30	110
Long Wittenham	Rev. J. C. Clutterbuck	12	1	6	170	28·46	...

DIVISION III.—SOUTH MIDLAND COUNTIES.

HERTS.							
Hoddesdon (Field's Weir)	N. Beardmore, Esq. C.E.	24	2	0	82	26·15	149
Hatfield (St. Mary's)	Rev. R. P. Davies	8	2	8	376	25·89	157
Bayfordbury	W. C. Baker, Esq.	8	0	4	250	25·39	162
St. Albans (Gorhambury)	Mr. G. Bogue	6	2	9	...	27·62	146
Hemelhempstead (Nash Mills)	J. Evans, Esq., F.R.S.	12	3	0	250	25·84	169
Berkhampstead	W. Squire, Esq.	8	1	6	361	28·73	173
Kensworth [Dunstable]	T. Jones, Esq.	5	1	0	902	28·95	145
Ware (Much Hadham)	Rev. H. S. Mott	5	1	1	222	26·40	182
Stevenage (Woodfield)	J. Bailey Denton, Esq.	...	1	6	300	26·00	170
Hitchin	W. Lucas, Esq.	9	1	6	238	24·77	161
Royston	H. Wortham, Esq.	8	0	6	266	24·86	...
BUCKINGHAMSHIRE.							
Eton	Rev. Herbert Snow	5	1	0	80	22·73	153
High Wycombe	H. S. Wheeler, Esq.	8	0	9	225	25·35	...
Missenden Abbey	J. Begbie, Esq.	...	1	0	...	31·66	...
Newport Pagnell	R. Littleboy, Esq.	4	2	0	...	25·47	...
OXFORD.							
Henley-on-Thames	T. F. A. Byles, Esq.	5	4	0	90	26·36	...
,, (Nuffield)	Rev. T. A. T. Hopkins	5	4	0	757?	24·31	...
Oxford (Radcliffe Observatory)	Rev. R. Main, F.R.S.	10	0	8	210	27·13	140
,, ,,	,, ,, ,,	12	24	0	234	21·52	130
,, ,, (Upper Heyford)	Rev. C. B. Mount	9	1	2	300?	24·53	151
*Bicester (Stratton Audley Park)	G. Glen, Esq.	5	3	0	295	24·17	...
Chipping Norton (Kingham)	Rev. J. W. Lockwood	5	3	5	442	27·54	...
Banbury (High Street)	T. Beesley, Esq.	6	7	0	350	26·42	185
,, (Neithrop)	F. Francillon, Esq.	5	1	0	340	26·29	...
NORTHAMPTON.							
Potterspury [Stony Stratford]	Rev. R. E. Crawley	5	0	4	...	26·57	176
Yardley-Hastings	Rev. R. W. Prichard	5	1	2	260	24·63	...
Weedon Beck	Rev. J. S. Winter	8	1	6	300	25·24	...
Northampton	H. Terry, Esq.	5	5	0	...	25·92	...
* ,, (Wellington Pl.)	Mr. G. Ellick	8	7	6	...	27·82	...
,, (Thorpelands)	H. J. Little, Esq.	...	0	8	280	24·15	155

DIVISION III.—SOUTH MIDLAND COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1867	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
NORTHAMPTON—(*con.*)						
Northampton (Althorp House)...	Mr. W. F. Jakeman...	8	3 4	310	24·38	147
Wellingborough	E. Sharman, Esq.	5	0 8	...	24·13	169
Kettering	John Wallis, Esq.....	8	1 6	300	25·71	171
HUNTS.						
St. Neots, (Tetworth Hall).....	Miss Kaye	5	0 6	200	24·20	143
„ (Waresley)	Rev. W. M. H. Elwyn	8	1 0	170	24·64	130
„	G. Bower, Esq.	5	1 6	70	23·91	...
Kimbolton (Hamerton)	Rev. A. F. Stopford ...	...	5 4	170	22·97	...
*Huntingdon (Wistow)	Rev. T. Woodruff.....	5	1 0	...	20·72	...
Conington Castle	J. M. Heathcote, Esq..	5	1 0	...	25·18	...
Standground Sluice, [Peterboro']	R. Lunn, Esq.	...	...	...	21·56	137
BEDFORD.						
Stotfold [Baldock].....	W. Denne, Esq.	5	0 9	220	23·22	140
Ampthill	W. S. Slinn, Esq.	5	1 1	...	26·00	108
Biggleswade	C. T. Newbery, Esq ...	5	5 6	...	22·56	...
Potton (Sutton Park).....	Sir J. M. Burgoyne, Bt.	5	1 1	...	22·76	139
Cardington	Mr. J. B. McLaren ...	8	0 0	109	23·57	...
„ (Staff gauge)	„ „ „	12	3 6	113	22·26	151
„	„ „ „	8	36 0	145	17·26	...
CAMBRIDGE.						
Abington Pigotts [Royston].....	G. Pigott, Esq.	8	0 6	130	26·13	164
Granchester Mill.....	J. Nutter, Esq.	5	4 0	45	23·26	155
Fulbourne	Rev. J. H. Usill.....	8	0 4	...	24·87	153
Cambridge (Beech House).....	J. Nutter, Esq.	8	4 0	40	23·88	168
„ (Brook House)...	G. Warren, Esq.	5	1 0	40	23·56	167
* „ (Observatory)	Professor Adams, F.R.S.	5	0 9	88	22·98	175
Ely (Stretham)	Mr. Edwin Stanley ...	9	4 9	...	21·74	141
Wisbech (North Brink).....	A. Peckover, Esq.	8	0 8	11	26·01	160
„ (Observatory)	S. H. Miller, Esq.....	8	0 6	10	26·08	155
„ „ (*monthly*)	„ „ „	5	0 6	10	25·81	...
„ „	„ „ „	8	8 0	18	25·05	155
„ „	„ „ „	20x10	35 0	45	20·11	...

DIVISION IV.—EASTERN COUNTIES.

ESSEX.							
Shoeburyness	Major Curtis	5	4	0	12	21·32	125
Rochford (Clement's Hall).....	A. Holt White, Esq....	8	4	0	25 ?	23·48	131
*Billericay.....	F. Carter, Esq.	5	1	0	...	28·03	165
Waltham Abbey.....	Captain Smith, R.A. ...	8	4	0	80	25·25	...
Epping.....	H. Doubleday, Esq. ...	8	6	0	360	27·10	137
Harlow (Sheering).....	Rev. Edward Hill ...	5	1	0	214	24·45	153
„ (Moor Hall)	Mr. Huntley	8	2	6	189	25·66	143
Witham (Dorward's Hall).....	H. Dixon, Esq.	6	1	6	20 ?	19·30	...
Dunmow (High Roding)	Rev. E. Maxwell	5	0	8	252	24·50	180
„	H. E. Cockayne, Esq...	12	0	6	234	23·94	170
*Colchester (Birch Hall).....	Mr. W. Ingle	5	1	0	...	23·43	162
„ (Broom Hill House)...	Captain Walker	5	1	3	87	28·96	121

DIVISION IV.—EASTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1867	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
ESSEX—(*con.*)						
Braintree (Bocking)	S. Tabor, Esq.	12	3 6	200	25·05	131
Halstead (Earl's Colne)	Harris Hills, Esq.	8	1 0	180	22·38	
,, (Hedingham Castle)	L. A. Majendie, Esq.	8	0 6	...	22·20	163
Saffron Waldon (Wimbish)	D. K. Emson, Esq.	8	1 6	...	25·82	117
,, ,, (Ashdon)	Rev. J. T. Walker	5	1 0	300	24·22	...
Heydon [Royston]	Mr. J. Bryan	5	1 1	140 ?	24·95	150
SUFFOLK.						
Nayland (Tendring Hall)	Mr. G. L. Rushmore	8	0 8	...	23·92	147
Sudbury	J. Alexander, Esq.	5	3 10	116	24·33	172
Ipswich (St. Peter's)	M. Oliver, Esq.	5	1 2	17	22·53	147
Hadleigh (Aldham)	J. F. Lloyd, Esq.	5	2 6	...	26·60	168
Grundisburgh	P. Harris, Esq.	5	3 8	...	23·18	179
Saxmundham (Carlton Hall)	Mr. Clark	8	5 0	...	23·95	...
BurySt.Edmunds(DrinkstonePk)	Mr. Nicholl	...	...	...	29·02	...
† ,, ,, (Abbeygate St.)	T. C. Hinnell, Esq.	6	45 0	...	26·50	142
† ,, ,, (Beech Hill)	H. Turner, Esq.	6	0 9	...	32·76	...
† ,, ,, (Westley)	R. Burrell, Esq.	5	1 6	...	26·46	...
† ,, ,, (Barton Hall)	Mr. W. Allan	5	1 0	...	26·84	155
† ,, ,, (Culford)	Mr. P. Grieve	5	1 2	...	27·27	140
Ixworth	Rev. W. Steggall	5	1 7	...	29·82	161
,, (Walsham-le-Willows)	Miss Martineau	5	0 11	...	27·46	170
,, (Barningham)	J. Fison, Esq.	8	1 2	...	24·48	...
Mendlesham (Thwaite)	Mr. Whistlecraft	...	3 6	150	28·86	...
Eye (Yaxley)	Rev. W. H. Sewell	8	1 0	199	25·31	172
Lowestoft (Gisleham)	Rev. H. Jodrell	5	1 2	...	23·19	...
,, (Carlton Colville)	G. Edwards, Esq.	8	0 9	6	23·07	...
,, (Somerleyton)	L. J. Crossley, Esq.	8	3 0	...	21·83	146
,, (,, Rectory)	Rev. C. J. Steward	5	1 0	...	22·74	146
,, (Hopton Hall)	C. Cory, Esq.	8	0 2	70	24·93	...
NORFOLK.						
Beccles (Geldeston)	E. T. Dowson, Esq.	5	1 0	40	22·42	162
Brandon (West Tofts)	Mr. R. Martin	5	1 0	...	24·06	160
*Downham Market (Bexwell)	Rev. E. J. Howman	5	0 11	...	24·27	117
,, ,, (Outwell Sluice)	R. Lunn, Esq.	...	4 0	16	21·46	87
,, (Fincham)	Rev. W. Blythe	3	4 0	60	23·19	...
Swaffham (Pickenham Hall)	.....	5	1 0	160	27·16	158
Norwich	C. Evans, Esq.	5	2 3	120	26·33	...
,, (Thorpe)	W. Birkbeck, Esq.	5	1 0	100	25·93	189
Acle	Rev. R. W. Kennion	8	0 9	40	24·16	...
Yarmouth (Runham)	Rev. E. Gillett	4	3 1	40	25·17	159
Norwich (Cossey)	H. Culley, Esq.	5	1 0	...	26·79	187
,, (Honingham)	Lady Bayning	5	0 6	110 ?	24·24	181
Dereham (Mattishall)	Rev. J. M. Du Port	8	1 2	165	26·58	179
*Swaffham	C. J. Drury, Esq.	5	1 10	239	29·84	186
East Dereham	G. H. Cooper, Esq.	8	3 0	...	27·73	...
*Reepham	T. Alderton, Esq.	5	1 0	...	25·70	170
Lynn (Hillington)	Rev. H. Ffolkes	5	4 6	93	26·46	177
Fakenham (Egmere)	R. Overman, Esq.	4	4 8	150	29·70	90

DIVISION IV.—EASTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Rain Gauge. Height Above Ground.	Rain Gauge. Height Above Sea Level	Depth of Rain. 1867	Days on which ·01 or more fell
			ft. in.	feet.	inches.	
NORFOLK—(*con.*)						
Burnham	H. E. Blyth, Esq.	3	4 6	102	25·95	169
„ (Westgate)	W. H. Spencer, Esq.	3	5 10	13	26·04	86
Holkham	J. Davidson, Esq.	8	0 0	39	25·68	152
„ „ „	„ „ „	12	4 0	43	25·48	152
Wells	H. R. Rump, Esq.	5	1 0	16	25·02	...
Hunstanton	Mr. J. Rippingale	11	3 8	60	21·18	114
DIVISION V.—SOUTH-WESTERN COUNTIES.						
WILTS.						
Landford	J. R. Wigram, Esq.	6	1 6	240?	27·39	157
Salisbury (Woodford)	H. Hinxman, Esq.	5	1 2	150	29·46	...
„ (Baverstock)	Ven. Archdeacon Hony	12	3 0	229	29·87	...
Heytesbury (Chiltern Ho.)	R. Hayward, jun., Esq.	11	4 0	380	29·15	166
Salisbury Plain (Orcheston)	Rev. J. Wardale	6	0 8	...	32·89	...
„ (Imber)	Rev. W. Slatter	5	3 8	400?	28·69	...
Devizes (Lavington)	F. Stratton, Esq.	5	2 0	500	30·95	...
Trowbridge (Holbrook Farm)	J. A. Fryer, Esq.	...	1 6	...	30·18	...
„ (Sunny Side)	W. J. Mann, Esq.	5	1 1	...	30·78	193
Marlborough	W. C. Merriman, Esq.	15	4 0	500	29·66	...
„ College	Rev. T. A. Preston	5	0 0	456	33·04	181
„ (Mildenhall)	Rev. C. Soames	5	0 8	500	31·46	177
†Calne (Castle House)	Colonel Ward	5	0 11	251	30·28	154
„ „ „	„ „ „	5	32 0	282	28·27	154
Chippenham (Tytherton)	Major Gritton	5	1 2	150	28·13	186
Swindon (Draycot Foliatt)	T. Arkell, Jun., Esq.	5	0 10	...	31·03	174
„ (Penhill)	T. Arkell, Esq.	5	0 10	...	29·82	162
DORSET.						
Weymouth	*The Times*	...	...	...	?30·71	...
„ (Osmington)	Captain Hall	5	1 0	150?	31·89	178
Wareham (Encombe)	Earl of Eldon	5	0 6	160	28·05	...
Upwey	J. Miller, Esq.	5	1 0	70	31·21	162
*Dorchester	J. Jowett, Esq.	5	0 6	250	35·16	162
Bridport	A. Stephens, Esq.	8	0 8	80	30·45	161
Cerne Abbas (Melbury)	Mr. T. C. Elliott	12	2 9	...	33·28	...
*Wimborne Minster (Chalbury)	Rev. G. H. Billington.	5	2 0	338	30 84	163
Blandford	W. Shipp, Esq.	5	1 0	...	33·06	...
„ (Longthorns)	J. C. Mansell	5	0 4	340	36·19	...
Shaftesbury	T. Ackland, Esq.	5	1 3	617	34·36	157
Gillingham	T. Thompson, Esq.	5	1 5	110	28·20	151
DEVON.						
Kingsbridge (Burton)	W. Balkwill, Esq.	5	30 6	120	27·52	...
„ (Fore Street Hill)	G. Fox, Esq.	5	0 6	68	47·51	188
Plymouth (Old Town Street)	A. P. Balkwill, Esq.	5	40 0	150	37·50	...
† „ (Saltram Gardens)	Mr. J. Snow	5	0 3	96	46·80	...
† „ (Ham)	Rev. C. T. C. Trelawny	5	3 0	94	43·87	162
Brixham (Lupton)	Mr. G. Erskine	12	3 2	200	41·16	138

DIVISION V.—SOUTH-WESTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level	1867	
			ft. in.	feet.	inches.	
DEVON—(*con.*)						
†Ivybridge (Torrhill)	J. Widdicombe, Esq....	5	0 4	270	53·98	...
†Plympton St. Mary (Ridgeway)	Miss B. T. Phillipps...	5	0 6	116	48·71	199
*Torquay (Lamorna)	W. Pengelly, Esq. ...	5	0 9	205	42·11	190
Newton Abbot (Devon-square)...	Mrs. Harris	5	6 0	...	37·43	142
†Newton Bushel (Highwick)	Dr. Barham	5	1 6	250?	39·44	162
†Dartmoor (Prison Reservoir) ...	Mr. H. Watts	5	0 2	1400	79·78	245
†Teignmouth (Landscore)	Mrs. Clark	5	0 6	200	40·34	146
„ (Bishopsteignton)...	Rev. S. M. Scroggs ...	5	6 6	100	38·56	170
†Tavistock (Public Library)	Mr. W. Merrifield.....	8	20 0	273	43·78	153
* „ (Mount Tavy)	H. Clark, Esq.	5	0 6	...	52·77	...
†Milton Abbot (Endsleigh).....	Mr. Cornelius.....	5	0 6	...	48·89	...
†Dawlish (Charlton Villa)	P. J. Margary, Esq. ...	5	0 8	62	39·48	...
†Bovey Tracey	J. Divett, Esq.	5	0 6	94	43·86	183
Exmouth (Budleigh Salterton)...	R. Walker, Esq.....	5	4 0	16	36·95	178
Chagford	R. L. Berry, Esq.	5	0 5	660	45·01	...
Sidmouth (Black Moor).....	W. Strahan, Esq.	5	1 0	25	36·34	184
„ (Belgrave)	Dr. Mackenzie	5	0 6	26	35·54	177
„	S. Chick, Esq.	10	25 0	43	29·82	163
Topsham (Clyst St. George)	Rev. H. T. Ellacombe.	5	1 3	80?	34·63	...
†Exeter (High Street).....	W. H. Ellis, Esq.	10	44 3	180	31·83	162
* „ „	„ „ „	5	47 11	184	32 04	163
† „(Devon & Exeter Institution)	Mr. E. Parfitt	6	13 7	155	32·70	133
† „ (Hoopern House)	G. Kennaway, Esq. ...	5	0 7	293	34·07	...
„ (Brampford Speke)	W. H. Gamlen, Esq....	5	0 3	140	35·55	193
„ „ „ (*monthly*)	„ „ „	8	0 2	140	36·37	...
Cullompton (Clysthydon)	Rev. J. Huyshe.....	3	1 6	200	33·88	...
„ (Bradninch)	H. Mathews, Esq.....	...	2 0	224	37·70	...
* „ (Strath Culm House)	C. R. Collins, Esq. ...	8	0 6	159	32·64	114
†Honiton (Broadhembury)	Rev. W. Heberden ...	5	1 6	400	35·69	184
Tiverton (Cove)	W. N. Row, Esq.	11	0 10	450?	38·67	...
„ (Broomfield)	Miss Patch.....	5	0 6	...	41·57	216
„ (Springfield)	H. Stokes, Esq.....	6	0 3	300?	41·78	231
Great Torrington	Rev. S. Buckland	5	1 1	321	43·76	191
S. Molton (Meshaw)	Rev. W. H. Karslake	8	0 6	472	43·71	196
*Bideford (Buckish).....	Rev. J. H. Kirwan ...	5	1 1	550	46·51	217
* „ (Northam)	Rev. I. H. Gosset	5	1 0	166	34·15	194
S. Molton (Castle Hill)	Mr. A. Saul	4	3 0	200	46·25	202
Barnstaple	T. Mackrell, Esq.	8	0 6	31	39·34	203
* „ (Bratton Fleming) ...	Rev. H. S. Pinder.....	5	1 0	600?	53·43	...
CORNWALL.						
Land's End (St. Sennen)	Rev. G. L. Woollcombe	5	4 10	390	31·36	198
Helstone	M. P. Moyle, Esq.....	5	5 0	115	38·34	183
Penzance	W. H. Richards, Esq.	12	2 6	94	37·06	...
Redruth (Tehidy Park)	Mr. H. Beddard	6	0 6	100	41·85	...
Truro (Royal Institution)	Dr. Barham	10	40 0	56	39·79	200
„ (Penarth)	N. Whitley, Esq.	11	1 0	190	42·29	206
St. Agnes.....	Dr. Barham	11	1 8	300	42·88	182

DIVISION V.—SOUTH-WESTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level	1867	
			ft. in.	feet	inches.	
CORNWALL—(*con.*)						
*St. Austell (Trevarna)	W. Coode, Esq.	5	0 7	300	46·39	193
Newquay	Mr. W. H. Tregidgo	6	1 9	90	33·97	185
Liskeard	S. W. Jenkin, Esq.	5	1 1	375	49·52	...
Callington (Pentillie Castle)	Mr. C. Edwards	5	1 3	...	50·19	173
,, (Hingston Down)	Captain Richards	11	1 0	850	61·72	207
,, (Harewood)	H. R. Trelawny, Esq.	5	4 0	120 ?	39·25	...
,, (Church Street)	Mr. Brown	5	3 0	490	54·03	...
Bodmin	Capt. Liddell, R.N.	8	2 6	325	47·91	222
,,	,, ,,	5	1 0	325	48·62	222
,, (Fore Street)	A. Hambly, Esq.	8	2 6	340	48·52	213
,, (Warleggan)	Rev. D. Clements	10	3 0	660	58·29	...
Wadebridge (Treharrock House)	F. B. Hambly, Esq.	5	3 6	303	38·12	210
Port Isaac (Roscarrock)	Mark Guy, Esq.	8	3 0	210	37·62	198
Launceston (Altarnum)	C. U. Tripp, Esq.	5	0 7	570	59·80	233
Camelford (Lanteglos)	Rev. J. I. Wilkinson	...	3 0	460	49·05	216
SOMERSET.						
Ilminster (South Petherton)	W. Blake, Esq.	8	1 8	200 ?	25·82	172
Ilebrewers (Walrond Park)	J. Ostler, Jun., Esq.	5	1 0	116	25·68	111
Ilchester	J. W. Bourne, Esq.	8	1 6	30 ?	25·98	125
*Wellington (Foxdown)	W. Elworthy, Esq.	5	1 0	...	33·70	172
*Taunton (Fullands School)	W. Reed, Esq.	5	1 4	...	28·80	157
, (College Shool)	Rev. W. Tuckwell	5	1 0	48	32·56	183
Langport (Long Sutton)	R. Palmer, Esq.	5	0 10	50	26·60	163
*Wiveliscombe	B. Boucher, Esq.	5	1 2	...	32·72	185
Glastonbury (Street)	W. S. Clark, Esq.	8	1 0	60	30·99	160
Wells (Dinder)	Rev. T. J. Bumpsted	8	4 0	140 ?	40·94	172
Burnham (The Colony)	J. P. Estlin, Esq	5	1 0	30	26·93	167
Frome (Mells Rectory)	Rev. J. H. Horner.	5	1 0	344	39·39	200
E. Harptree (Sherborne Reservoir)	Bristol Water Works	5	1 0	338	44·99	...
*Weston-super-Mare	Mr. J. Boycott	6	0 3	8	26·03	188
Chew Magna [Bristol]	Bristol Water Works	5	1 0	160	32·96	...
Bath (Paragon)	Dr. Barter	5	1 3	113	30·45	160
,, (Literary Institute)	C. P. Russell, Esq.	5	8 0	65	30·45	163
,, (Weston)	...	5	10 0	190	30·58	187
,, (Batheaston)	A. Mitchell, Esq.	12	2 0	226	29·16	162
,, (Swanswick)	Rev. F. Lockey	10	32 0	...	24·54	144
Chelvey [Bristol]	Rev. J. Matthew	5	0 5	37	33·03	205
Barrow Gurney Reservoir	Bristol Water Works	5	1 0	320	37·80	...
Brislington [Bristol]	G. Thomas, Esq.	...	5 0	100	30·18	...

DIVISION VI.—WEST MIDLAND COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1867 inches.	Days on which ·01 or more fell.
GLOUCESTER.							
Bristol (Small St.)	Bristol Water Works	5	25	0	40	31·12	...
„ (Montpelier)	F. P. Bisson, Esq.	5	2	0	100	32·29	184
Clifton (South Parade)	Dr. G. F. Burder	8	0	6	192	33·97	172
„ (Royal York Crescent)	A. North, Esq.	12	0	8	197	34·34	177
„ („ „ „)	.....	5	0	8	197	34·11	176
Berkeley (Chantry Cottage)	E. Osborne, Esq.	5	1	6	60	28·79	195
„ (Lydney)	W. H. Bathurst, Esq.	8	1	0	35	29·60	...
Fairford	J. Powell, Esq.	5	0	8	...	29·46	178
Cirencester	T. C. Brown, Esq.	10	1	2	446	33·70	103
Stonehouse	W. Bishop, Esq.	5	1	0	...	27·00	...
Stroud (Castle Villas)	J. Bateman, Esq.	...	1	0	240	28·93	189
Frampton-on-Severn (Saul Lodge)	W. B. Clegram, Esq. C.E.	5	3	6	42	24·94	178
Northleach (Yanworth)	T. Arkell, Esq.	5	1	0	...	31·91	...
Gloucester (Witcomb Court)	A. Bubb, Esq.	8	2	0	225	23·74	...
„ (Quedgeley)	J. C. Hayward, Esq.	5	0	10	50	26·36	...
„ (Park Ho.)	A. Price, Esq.	5	3	6	50	21·76	...
Cheltenham (Keynsham Bank)	H. D. Humphries, Esq.	8	6	6	232	25·74	141
„ (Heatherley Sew. Wks.)	„ „ „	...	16	9	172	20·36	163
„ (Chelt „ „)	„ „ „	...	16	9	169	17·23	153
Newent (Boyce Court)	General Drummond	8	1	3	133	25·46	152
HEREFORD.							
Ross (Rocklands)	J. M. Herbert, Esq.	8	1	10	100?	31·55	153
Ross	H. Southall, Esq.	5	1	4	200?	29·10	170
Hereford (Broomy Hill)	T. Curley, Esq., C.E.	5	0	11	158	28·48	195
„ (Blue Coat School)	E. J. Isbell, Esq.	8	5	6	200	28·17	204
„ (Tupsley)	P. Ballard, Esq.	5	1	0	...	28·20	...
„ (Stretton)	Rev. H. C. Key	8	1	0	170	28·17	155
Leominster (West Lodge)	E. P. Southall, Esq.	5	1	0	229	25·26	195
„ (Leysters)	Rev. T. S. Hewitt	5	0	6	700?	27·62	...
SHROPSHIRE.							
Burford [Tenbury]	Lord Northwick	5	1	0	180	24·88	...
Ludlow (Knowbury)	Rev. J. B. James	5	1	0	1000?	25·89	...
„ (Mill Street)	W. Marston, Esq.	5	1	1	350	29·07	187
Church Stretton (Woolstaston)	Rev. D. Carr	5	1	0	790	32·80	198
Shiffnal (Haughton Hall)	Rev. J. Brooke	4	3	6	450?	25·43	147
Shrewsbury (Highfield)	T. Howells, Esq.	5	5	6	200	23·00	...
„	Marshall & Co.	10	4	4	192	17·45	...
„ (Monkmoor)	Miss Lovett	5	1	0	200	24·10	175
„ (Fitz Manor)	R. Middleton, Esq.	5	2	6	260?	24·70	...
Newport (Church Aston)	Rev. W. Nickisson	5	2	0	260	26·46	190
„	J. Bodenham, Esq.	5	1	0	250	26·51	193
Oswestry (Hengoed)	Rev. A. R. Lloyd	5	6	0	471	33·78	...
Market Drayton (Nort'n-in-Hales)	Rev. F. Silver	8	0	6	335	24·39	132
STAFFORD.							
Wolverhampton (Oaklands)	H. Ward, Esq.	5	0	10	520	26·43	149
„ (Waterloo Road)	C. G. DeLessert, Esq.	5	1	1	500	25·83	167
„ (Wadham's Hill)	Rev. E. W. Winter	8	3	6	510	23·83	...
„ (Pattingham)	Rev. B. S. Malden	5	1	0	450?	22·87	124

DIVISION VI.—WEST MIDLAND COUNTIES—(*continued*).

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height above SeaLevel	Depth of Rain. 1867	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
STAFFORD—(*con.*)						
Wolverhampton (Wrottesley) ...	J. Hough, Esq.	3	0 4	530	24·87	163
„	„ „ „	8	0 8	530	23·64	163
Weston-under-Lyzziard[Shiffnal]	Hon. Rev. J. Bridgeman	3	0 10	...	26·08	182
Chatwell [Newport]	Rev. W. Eyre	5	1 0	340	25·78	...
Burton-on-Trent	J. Matthews, Esq.....	5	6 0	152	20·79	147
Stoke (Barlaston)	W. Scott, Esq.	5	0 6	530	31·37	163
Oakmoor (Ellaston)	Rev Sir C. R Lighton, Bt.	5	3 0	400	34·59	178
Stoke (Stanley Reservoir).....	J. Forbes, Esq., C.E...	5	3 1	550	30·89	139
„ (Etruria)	„	5	4 2	440	33·16	180
Leek (Rudyard)	„	5	12 7	500	35·86	144
Knypersley [Congleton]	„	5	14 0	500	29·03	171
Wincle [Macclesfield]	„	5	5 0	500	35·33	151
WORCESTER.						
Northwick Park.....	Lord Northwick	8	1 0	...	25·98	...
Evesham (Lansdowne)	R. Burlingham, Esq...	6	4 6	120	25·70	172
Great Malvern	Messrs. Burrow.....	5	0 10	522	28·67	189
„ (Gazebo)	Dr. Williams	2	4 0	450	26·45	...
West Malvern	A. H. Hartland, Esq.	8	1 6	900	28·59	...
Worcester (Lark Hill)	W. Burgess, Esq.	5	1 0	157	27·43	149
„ (Gas Works)	F. N. Gosling, Esq. ...	10	4 1	...	24·60	...
Tenbury (Orleton)	T. H. Davis, Esq.....	5	0 9	250	29·27	213
Bromsgrove.....	G. Dipple, Esq.....	11	4 4	273	26·11	165
Moseley [Birmingham].....	T. L. Plant, Esq.	6	4 0	481	31·55	195
Stourbridge (Dunsley)	J. Bourn, Esq.	5	0 10	...	25·35	171
WARWICK.						
Henley-in-Arden.....	G. R. Dartnell, Esq....	5	2 0	400	25·16	144
Leamington	S. U. Jones, Esq.	5	0 8	195	26·80	150
Rugby	F. Fuller, Esq.	12	2 4	384	29·51	159
Coventry (Radford).....	A. F. Atkins, Esq.....	8	1 0	305	26·61	125
Pailton House [Lutterworth] ...	Capt. Constable Curtis	5	1 0	...	26·82	141
†Birmingham (Bloomsbury Street)	D. Smith, Esq.	8	0 10	340	31·04	...

DIVISION VII.—NORTH MIDLAND COUNTIES.

LEICESTER.						
Knaptoft Hall [Rugby].....	T. Willson, Esq.....	5	1 6	...	24·90	150
†Market Harborough (Fleckney)	J. B. Putt, Esq.....	5	0 8	411	21·41	...
Hinckley (Stretton Fields).....	T. J. Scott, Esq.....	5	0 6	...	27·28	177
†Wigston	T. Burgess, Esq.....	8	0 6	220	24·91	135
Loddington Hall.....	A. C. Johnson, Esq. ...	5	1 0	...	24·66	153
†Leicester	H. Billson, Esq.....	8	0 6	237	27·65	145
†Thornton Reservoir	J. Bevins, Esq.	10	2 8	420?	26·21	...
Appleby	Rev. F. B. Falkner ...	5	1 0	333	27·05	...
†Owston [Oakham]	Miss Gilford	5	1 0	580	29·45	183
Melton Mowbray (Dalby Hall)...	Mr. G. Jones	8	2 6	480?	25·99	171
Loughborough.....	J. Giles, Esq.	...	...	...	27·46	...
„ (Emmanuel Rec.)	Rev. R. J. Bunch	8	0 5	210?	25·17	...
„ (Belton).....	Rev. R. Dalby	5	4 0	250	26·12	169

DIVISION VII.—NORTH MIDLAND COUNTIES.—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Gauge. 1867 inches.	Days on which 1 or more fell.
LEICESTER—(*con.*)							
Waltham Rectory	Rev. G. E. Gillett	8	0	8	560?	23·47	155
†Belvoir Castle	W. Ingram, Esq.	8	1	0	237	27·01	164
RUTLAND.							
Tickencote Warren	Rev. C. L. Wingfield.	8	2	0	...	24·03	128
Greetham	Rev. C. A. Holmes	5	0	10	...	26·36	134
LINCOLN.							
Stamford	Dr. Newman	5	1	0	...	25·39	...
*Bourne (Wytham-on-the-Hill)	A. C. Johnson, Esq.	5	1	3	167?	20·64	149
†Grantham	J. W. Jeans, Esq.	8	0	6	179	25·02	162
Sleaford (Heydour)	Rev. G. F. Deedes	5	3	0	...	21·24	110
Boston	Dr. Mercer Adam	5	1	0	20	25·25	203
„	W. H. Wheeler Esq. C.E	5	8	0	20	25·94	193
Stubton [Newark]	G. Nevile, Esq.	5	5	0	...	24·92	163
Spilsby (Welton-le-Marsh)	Rev. A. Wright	5	3	6	180?	26·67	151
Lincoln (Branston)	A. S. Leslie Melville, Esq	5	0	9	...	24·31	...
„	M. S. & L. R. Co ‡	9	3	6	26	23·46	117
Gate Burton	„ „ „	9	3	6	96	23·99	151
Louth	T. W. Wallis, Esq.	3	5	0	80	28·82	192
Market Rasen	M. S. & L. R. Co.	9	3	6	100	25·44	118
Gainsborough	„ „ „	9	3	6	76	19·66	147
„ (Belmont Ho)	T. Dyson, Esq.	12	8	0	30	22·71	156
Stockwith	M. S. & L. R. Co.	9	3	6	21	22·57	105
Brigg	„ „ „	9	3	6	16	22·85	136
Grimsby	„ „ „	9	15	0	42	21·58	166
Barnetby	„ „ „	9	3	6	51	19·21	151
Ulceby (Killingholme)	Rev. J. Byron	5	1	4	60	24·34	213
Brigg (Appleby)	Rev. J. E. Cross	5	0	9	60	23·43	173
„ (Ferriby Sluice)	„ „ „	5	0	9	10	20·53	...
New Holland	M. S. & L. R. Co.	9	3	6	18	20·54	179
NOTTS.							
Nottingham (Ruddington Grange)	C. Paget, Esq.	8	1	1	...	25·15	156
Beeston Meadow	Mr. W. Barker	8	1	1	100	25·47	...
Nottingham Park	Mr. W. Chapman	5	1	3	80	28·08	...
„ (Arboretum)	M O. Tarbotton Esq C.E	8	0	5	238	29·90	154
Southwell (Oxton)	H. Sherbrooke, Esq.	2	2	0	...	27·09	...
„	W. W. P. Clay, Esq.	6	1	6	200	22·72	...
Welbeck Abbey	Mr. W. Tillery	13	3	0	50	26·39	124
Worksop	M. S. & L. R. Co.	9	3	6	127	21·83	139
Retford	„ „ „	9	3	6	52	23·93	108
DERBY.							
Sawley	Mr. J. Windle	5	0	9	100	25·47	...
Sudbury	A. Dick, Esq.	5	1	9	174	31·87	156
Doveridge [Uttoxeter]	Mr. Povey	6	4	0	270	25·98	137
Derby	J. Davis, Esq.	5	5	0	180	29·37	170
„ (Morley)	Rev. S. Fox	5	3	0	406	29·85	...
„ (West Hallam)	Rev. C. J. Newdigate	5	2	0	354?	28·70	168

‡ Kept for the Canals Department of the Manchester, Sheffield, and Lincolnshire Railway Company. Returns supplied by R. D. Heathcote, Esq.

DIVISION VII.—NORTH MIDLAND COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1867 inches.	Days on which .01 or more fell.
DERBY—(*con.*)							
Derby (Duffield)	W. Bland, Esq.	5	0	6	200 ?	27·09	126
Belper	J. G. Jackson, Esq.	5	0	8	...	29·86	169
Cromford (Willersley)	Mr. Tissington	6	1	5	600	37·03	...
Matlock Bath	R. Chadwick, Esq.	5	1	6	500 ?	35·52	...
† Chatsworth	J. Taplin, Esq.	8	6	0	360?	35·21	182
Chesterfield	M. S. & L. R. Co.	9	3	6	248	30·08	110
Brampton (Fairfield)	J. M. Hewitt, Esq.	5	6	8	510	33·54	193
„ (St. Thomas')	Rev. J. M. Mello	5	6	6	326	32·71	166
Buxton (Devonshire Hospital)	E. J. Sykes, Esq.	8	5	0	1000	65·09	193
Stony Middleton	Rev. U. Smith	5	4	0	640 ?	36·52	150
Norwood	‡M. S. & L. R. Co.	9	3	6	238	24·77	148
Comb's Moss	„ „ „	9	3	6	1669	48·95	...
„ Reservoir	„ „ „	9	3	6	710	47·98	192
† Chapel-en-le-Frith	„ „ „	9	3	6	965	43·51	180
Woodhead	„ „ „	9	3	6	878	52·83	172

DIVISION VIII.—NORTH-WESTERN COUNTIES.

CHESHIRE.							
Nantwich (Cholmondelly Cas.)	E. L. Williams, Esq.	...	...		...	29·01	...
Bosley Minns	M. S. & L. R. Co.	9	3	6	1210	36·77	118
„ Reservoir	„ „ „	9	3	6	590	32·44	150
Macclesfield	„ „ „	9	3	6	539	31·66	134
„ (Park Green)	W. Jeffrey, Esq.	5	2	9	450	37·68	176
„ (Town Yard)	H. S. Aspinwall, Esq.	8	2	6	425	36·50	158
Chelford	Mr. C. Nichols	...	...		...	30·97	...
Northwich	E. L. Williams, Esq.	8	1	6	42	29·19	...
Frodsham (Kingsley)	Rev. R. Tyas	...	0	8	193	29·15	181
Runcorn (Weston Point)	E. L. Williams, Esq.	5	1	0	15	29·47	...
Bollington (Spond's Hill)	M. S. & L. R. Co.	9	3	6	1279	35·41	...
Whaley	„ „ „	9	3	6	602	50·94	189
Handforth (Quarry Bank)	J. Henshall, Esq.	8	0	8	295	34·90	...
Altringham (Warburton)	Rev. D. A. Beaufort	...	1	0	...	33·55	...
Birkenhead (Bidstone Obs.)	J. Hartnup, Esq.	8	0	6	182	25·09	164
„ (Wallasea)	W. Bouch, Esq.	5	0	4	19	28·23	199
Marple Aqueduct	M. S. & L. R. Co.	9	3	6	321	34·38	183
„ Top Lock	„ „ „	9	3	6	543	39·08	181
Stockport (Wellington Road)	J. Sidebottom, Jun. Esq.	...	...		...	27·49	176
Mottram Hill End	M. S. & L. R. Co.	9	3	6	680	46·54	179
„ Matley's Field	„ „ „	9	3	6	399	43·01	181
Newton	„ „ „	9	3	6	396	29·64	172
LANCASHIRE.							
Warrington (Penketh)	L. W. Reynolds, Esq.	8	1	0	39	30·60	185
West Derby (Sandfield Park)	Mr. W. Biggs	8	1	2	147	27·42	194
Prescot (Knowsley)	J. Freeman, Esq.	5	10	0	190	28·97	...
† Manchester (Old Trafford)	G. V. Vernon, Esq.	8	2	7	106	34·58	173
† „ „ „	J. Curtis, Esq.	8	2	3	111	33·48	188

DIVISION VIII.—NORTH-WESTERN COUNTIES—(*continued*).

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1867	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
LANCASHIRE—(*con.*)						
Manchester (Plymouth Grove)...	J. F. Roberts, Esq.....	8	3 8	150	34·43	176
„ (Eccles)	T. Mackereth, Esq. ...	10	3 0	145	35·52	211
„ „	„ „ „	5	34 0	179	30·07	211
„ (Ardwick)	J. Casartelli, Esq.....	9	3 0	...	34·49	183
† „ (Piccadilly)	M. S. & L. R. Co.....	9	40 0	194	31·47	179
Fairfield	„ „ „	9	6 0	312	40·95	185
Manchester Water Works. Gorton Reservoir	J.F.Bateman,Esq.FRS	...	...	263	34·17	...
Denton „	„ „ „	...	...	324	34·11	...
Godley „	„ „ „	...	...	500	36·57	...
Arnfield „	„ „ „	...	..	575	39·46	...
Rhodes Wood „	„ „ „	...	...	520	49·55	...
Woodhead „	„ „ „	...	...	680	55·96	...
Torrside „	„ „ „	...	...	600	47·98	...
Stoneclough (Outwood).....	W. Horrocks, Esq. ...	12	1 0	295	38·70	188
Oldham (Gas Works).....	J. Taylor, Esq.	9	6 0	600	37·97	192
„ (Waterhouses)	M. S. & L. R. Co.....	9	3 6	345	37·64	171
„ (Strines Dale)	J. Taylor, Esq.	10	6 0	800	38·20	226
„ (Brushes Clough)	„ „ „	10	6 0	950	44·45	229
„ (Picthorne)	„ „ „	10	6 0	800	41·26	206
*Oldham (Royton)	J. Heap, Esq.....	5	1 0	484	44·32	195
Radcliffe (Mount Sion)	H. Eaton, Esq.	10	1 3	250	37·50	...
Bolton-le-Moors (The Folds).....	H. H. Watson, Esq....	10	3 6	286	45·27	...
„ (Vale Bank).....	J. Watkins, Esq.	10	3 0	300	45·60	170
Bolton (Heaton)	H. Baylis, Esq.	10	0 0	500	44·40	147
„ „	J. S. Holdsworth, Esq	10	3 6	497	44·88	194
„ (Belmont)	H. Baylis, Esq.	10	0 0	800	52·20	165
Rochdale (Nagden Dane).....	C.E. Cawley, Esq.C.E.	5	1 6	900	40·87	...
Ormskirk (Rufford)	J. Porter, Esq.	5	0 8	38	30·41	181
Blackburn (W. Works Office)...	J.F.Bateman,Esq.FRS	...	...	400	37·72	...
„ (Pickup Reservoir) ...	„ „ „	...	...	720	39·00	...
„ (Guide Reservoir) ...	„ „ „	...	...	650	37·50	...
„ (Audley Place).....	J. Shackleton, Esq. ...	5	0 6	450	45·66	182
Burnley W. Works (Swindon)...	J. Emmett, Esq.	...	18 0	750	38·30	...
Preston (Howick House)*old gauge*	T. Norris, Esq.	12	0 6	72	32·65	...
„ „ (*new gauge*)	„ „ „	12	0 6	73	33 65	...
Preston (House of Correction)...	Mr. J. Hesketh	7	1 1	140	34·83	...
„ „ „	„ „ „	7	53 6	187	28·76	...
„ (Holme Slack)	J. Armytage, Esq.,C E.	8	1 2	143	35·70	...
Blackpool (South Shore)	G. Sharples, Esq.	10	1 8	29	31·04	...
Stonyhurst College	Rev. W. Sidgreaves ...	11	1 3	381	47·04	201
Preston W. Works. Alston	J. Armytage, Esq.,C.E.	8	1 2	320	39·30	...
Knowl Green	„ „	8	1 2	400	36·90	...
Lond-scales	„ „	8	1 2	400	39·73	...
Spade Mill	„ „	8	1 2	400	39·09	...
Clitheroe (Downham Hall)	R. Assheton, Esq.....	10	1 6	464	40·22	...
Garstang (Vale House)	J. Jackson, Junr., Esq.	6	4 3	455	40·12	196
„ (Greizedale)	B. Riley, Esq.	5	1 0	438	44·00	...
Lancaster (South Road)..	W. Roper, Esq.....	12	3 6	118	35·77	185

DIVISION VIII.—NORTH WESTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1867 inches.	Days on which ·10 or more fell.
LANCASHIRE—(*con.*)							
†Lancaster (Caton)	Rev. A. Christopherson	5	1	9	120	38·34	159
Hest Bank	T. Ransome, Esq.	12	2	2	58	32·07	...
Melling (Hornby Castle)	C. H. Lethbridge, Esq.	12	3	2	103	40·15	130
„ (Storr's Hall)	F. F. Pearson, Esq.	5	1	0	210	37·84	...
Yealand Conyers [Milnthorpe]	Rev. T. Birkett	5	3	0	220	36·93	189
Leck Hall [Kirkby Lonsdale]	H. T. Welch, Esq.	5	1	3	498	38·72	...
†Cartmel (Allithwaite)	Mr. W. R. Nash	5	1	0	88	35·90	185
† „ (Holker)	Mr. Wilson	8	4	8	155	41·07	199
„ (Grange)	A. Beardsley, Esq.	8	3	0	25	43·06	185
*Ulverston	J. H. Matthews, Esq.	5	5	6	98	49·72	196
Newby Bridge (Backbarrow)	T. Ainsworth, Esq.	12	3	3	70	43·30	...
†Monk Coniston Park	J. G. Marshall, Esq.	10	4	11	150	82·61	...

DIVISION IX.—YORKSHIRE.

WEST RIDING.							
Sheffield (Station)	M. S. & L. R. Co.	9	3	6	188	29·96	172
„ (Edge)	„ „ „	9	3	6	336	35·85	193
„ (Broomhall Park)	D. Doncaster, Jun. Esq.	10	2	0	337	32·36	202
„ (Crookesmoorside)	„ „ „	10	0	6	600	31·93	...
„ (High Hazles)	Mrs. Hounsfield	9	3	0	...	28·10	...
Redmires	J. Gunson, Esq.	...	4	0	1100	38·85	...
Tickhill	Dr. Dixon	8	2	0	61	25·46	165
†Rotherham (Moorgate Grove)	R. Chrimes, Esq.	5	1	0	262	26·05	162
„ (Masboro' Parsonage)	Rev. H. Masters White	5	1	0	125	25·74	170
Wath-upon-Dearne	W. M Burman, Esq.	8	6	6	186	21·68	149
Doncaster (Magdalens)	Mr. J. Howorth	5	5	9	46	33·08	112
Dunford Bridge	M. S. & L. R. Co.	9	3	6	954	55·94	204
„ (Reservoir)	Mr. G. Whitfield	12	2	0	1100	53·72	...
Carlcotes	M. S. & L. R. Co.	9	3	6	1075	60·52	193
Penistone	„ „ „	9	3	6	717	28·46	175
Barnsley	Dr. Sadler	5	1	3	350	27·41	205
„ (Ardsley)	Miss Mammoth	5	1	2	300	20·41	...
Holmfirth (HolmeStyes Reservoir)	J. F. Bateman, Esq. FRS	...	...		850	34·50	...
„ (Boshaw Whams Reservoir)	„ „ „	...	...		950	35·30	...
„ (Bilberry Reservoir)	„ „ „	...	...		800	37·90	...
Saddleworth (Friesland)	G. Venables, Esq.	5	3	6	630	47·29	170
„ (Station)	E. Greenwood, Esq.	10	5	0	640	41·60	...
Standedge	„ „ „	8	2	0	1150	47·00	...
Ackworth School	A. Wright, Esq.	5	0	3	135	26·7	149
†Wakefield Prison	W. R. Milner, Esq.	10	4	0	115	27·20	...
Huddersfield (Nortonthorpe)	A. M. Box, Esq.	3	0	3	475	31·98	198
„ (Longwood)	C. K. Hare, Esq.	10	4	6	600	31·70	187
„ (Dalton)	J. W. Robson, Esq.	5	0	6	350	31·03	178
„ („)	„ „ „	8	0	6	350	31·15	178
Goole	T. Kendall, Esq.	11	3	4	...	30·22	184
Mirfield (Cote Wall)	E. B. W. Balme, Esq.	8	0	9	200	27·52	138

DIVISION IX.—YORKSHIRE—(*continued*).

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1867	Days on which ·01 or more fell.
			ft in.	feet.	inches.	
WEST RIDING—(*con.*)						
Mirfield (Calder F. Reformatory)	Mr. J. Johnson	8	0 5	320	28·95	...
Todmorden (Stansfield Hall)	J. Fielden, Esq.	8	13 8	500 ?	32·25	175
*Huddersfield (Rastrick)	A. Clay, Esq.	5	1 3	410	27·79	157
Halifax (King's Cross)	J. Gledhill, Esq.	8	30 0	690	20·21	...
† „ (Well Head) *monthly*	J Waterhouse, Esq. F.R.S	12	0 11	487	30·94	170
„ („) *(daily)*	„ „ „	7	0 10	527	36·48	170
„ (Dean Clough Mills)	Mssrs. J. Crossley & Sons	...	15 0	440	38·45	...
„ (Museum)	L. J. Crossley, Esq.	...	1 0	...	35·83	187
„ (Warley Moor)	J. Richardson, Esq. C.E.	10	2 0	1425	45·10	...
„ (Midgeley „)	„ „ „	10	2 0	1350	49·70	...
„ (Ovenden „)	„ „ „	10	2 0	1375	43·80	...
Bradford (Mechanics' Institute)	C. Lund, Esq.	8	48 0	373	24·06	178
„ (Manywells)	C. Gott, Esq.	5	0 9	700	33·62	164
„ (Chellow Dean)	„ „	10	5 0	650	25·27	110
„ (Doe Park)	„ „	8	0 9	810	39·13	181
„ (Queensbury)	W. Foster, Esq.	5	5 4	1050	39·42	123
Leeds (Leventhorpe Hall)	J. T. Leather, Esq.	10	2 0	90	24·18	...
† „ (Holbeck)	Messrs. Marshall & Co.	10	32 0	127	21·90	...
„ („)	„ „ „	5	1 0	95	25·17	...
† „ („ W. Works Depot)	E. Filliter, Esq, C.E.	10	0 6	95	26·02	150
„ (Eccup)	„ „ „	10	0 6	340	25·70	182
„ (Westwood Hall)	H. C. Marshall, Esq.	5	0 7	400	27·66	175
„ (Philos. Hall)	H. Denny, Esq.	10	48 0	137	20·95	...
Shipley (Baildon Green)	Rev. H. M. Stallybrass	5	6 0	270	31·04	176
Keighley (Braithwaite)	Mr. W. Shackleton	5	6 6	770	38·97	183
Otley	H. Thorns, Esq.	8	0 7	206	25·18	144
Ilkley	Dr. Scott	5	0 6	500	30·93	144
†York (Bootham)	F. Thorp, Esq.	5	0 6	50	25·16	155
† „ (Coney Street)	Mr. Sigsworth	5	8 0	40	26·71	159
„ (Cherry Hill)	H. Richardson, Esq.	5	1 4	60	24·74	...
Thornton-in-Craven	T. Wilson, Esq.	5	5 4	456	36·15	213
Whiteholme [Clitheroe]	Mrs. Birchall	5	1 6	...	53·97	...
†Harrogate	Dr. Bainbridge	8	0 6	420	30·23	155
Skipton	Rev. R. H. Sidgwick	10	0 6	430	?45·86	186
„ (Woodlands)	J. Heelis, Esq.	5	0 8	430	35·03	188
Settle	J. Tatham, Esq.	12	40 0	498	35·26	...
Ingleborough	J. Farrer, Esq.	...	...	...	33·10	...
Arncliffe	Rev. W. Boyd	8	2 8	750	54·68	180
Ripon (The Knoll)	Rev. F. W. Stow	5	0 6	112	25·86	...
„	„ „ „	5	1 0	112	25·23	...
„	„ „ „	12	5 0	116	24·92	188
Wharfedale (Outershaw)	C. H. L. Woodd, Esq.	...	1 3	1200	63·24	...
Sedbergh (Thorne)	Miss Elam	5	1 1	400 ?	54·59	201
„ (Dentdale, Stone House)	„ „ „	5	1 4	800	64·56	193
EAST RIDING.						
Patrington	W. B. Pugh, Esq.	5	0 3	28	24·34	196
†Hull (Manor House Street)	W. Lawton, Esq.	5	0 10	14	22·51	170

DIVISION IX.—YORKSHIRE—(*continued*).

STATIONS.	AUTHORITIES,	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1867 inches.	Days on which ·01 or more fell.
EAST RIDING—(*con.*)							
†Hull (Beverley Rd., York Parade)	J. Smith, Jun., Esq. ...	8	3	10	11	24·10	184
„ („ „ N. Parade)	W. Lawton, Esq.	7	2	0	...	22·70	...
„ (Baker Street).....	A. O. Atkinson, Esq...	...	1	6	10?	22·23	...
„ (People's Park)	W. Lawton, Esq.	6	1	0	...	24·02	185
„ (Cottingham)	J. H. Hill, Esq.....	8	1	3	25	24·28	169
†Holme-on-Spalding-Moor	G. Dunn, Esq.	5	3	0	30	26·80	202
Thorganby (Thicket Priory).....	Miss M. C. D. Jefferson	6	1	4	26	23·15	122
Pocklington (Warter).....	J. Coxon, Esq.....	5	1	10	...	29·87	190
Ganton [Scarborough]	Hon. Lady Legard ...	10	2	0	150?	27·74	...
NORTH RIDING.							
Flaxton	H. Richardson, Esq....	5	1	3	120	25·51	...
†Malton	H. Hurtley, Esq.	10	1	0	73	29·06	...
*Filey Reservoir	D. Philliskirk, Esq. ...	5	9	0	183	23·56	...
Thirsk	A. O. Atkinson, Esq...	...	2	6	114	24·97	...
Beadlam Grange.....	J. H. Phillips, Esq. ...	5	0	6	192	28·34	...
Scarborough	Dr. Cornelius Fox.....	5	1	0	102	29·33	195
Catterick (Tunstall)	H. C. Marshall, Esq....	5	1	0	350	22·80	...
Richmond (Aske)	Earl Zetland	12	2	8	550	27·05	...
*Whitby.....	M. Simpson, Esq.	5	2	0	184	25·02	185
„ (Ruswarp)	A. O. Atkinson, Esq...	...	1	6	7	28·18	...
Middlesborough (Marton Hall)...	H. Bolckow, Esq.	...	1	3	120	20·69	...
Middlesborough	W. Fallows, Esq.	...	2	0	21	17·86	132
Redcar (Upleatham)	M. Gray, Esq.....	4	0	4	330	18·00	...

DIVISION X.—NORTHERN COUNTIES.

DURHAM.							
Eaglescliffe [Yarm].....	Rev. J. Hull	5	1	0	80	23·05	175
*Darlington (Dinsdale)	Rev. J. W. Smith	5	1	6	50	26·66	175
„ (Southend)	Mr. J. Richardson ...	5	4	0	140	40·79	...
Winston (Stubb House)	T. Dodgson, Esq.	5	0	9	458	20·65	...
Wolsingham (St. John's)	W. Backhouse, Esq. ...	5	1	1	928	31·87	193
Stanhope Castle	Mr. T. Surtees	8	4	0	670	31·33	...
Durham Observatory.....	J. J. Plummer, Esq....	12	4	6	335	19·43	113
„ (S. Cuthbert's Col. Ushaw)	Rev. Dr. Gillow	5	0	10	600	25·85	162
Seaham (Hall).....	R. Draper, Esq.....	5	1	0	100	23·62	144
„ (Vicarage).....	Rev. A. Bethune	5	0	4	80	25·53	155
Shotley Hall	Mr. J. Coulson	5	0	3	312	24·71	139
†Sunderland (Hendon Hill)	J. W. Mounsey, Esq.	5	0	6	120	23·34	174
„ (West Hendon).....	T. W. Backhouse, Esq.	5	1	0	132	23·87	...
† „ (The Hall).....	Rev. G. Iliff	10	1	6	85	24·50	134
Bishopwearmouth	Dr. Ogden	8	30	0	130	18·40	...
„ (Esplanade)...	Dr. Pyle.....	...	8	2	128	25·15	...
NORTHUMBERLAND.							
Allenheads	M. Varty, Esq.	8	0	9	1360	49·45	224
Haltwhistle (Whitfield)	Rev. J. M. Mason	5	1	0	806	31·34	182
Bywell	Mr. J. Dawson	8	0	6	87	27·55	226
Wylam.....	G. C. Atkinson, Esq...	10	5	0	96	22·38	144

DIVISION X.—NORTHERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain 1867	Days on which 01 or more fell.
			ft. in	feet.	inches	
NORTHUMBERLAND—(*con.*)						
Newcastle (Philos. Soc.)	W. Lyall, Esq.	8	1 2	105	21·78	153
North Shields (Wallsend)	J. W. Dees, Esq.	10	0 6	90	25·34	...
† „ (Rosella Place) ...	R. Spence, Esq.....	8	1 0	124	23·60	163
„ (Low Lights).....	J. R. Procter, Esq. ...	8	3 1	20	22·49	176
„ (Tynemouth).....	P. J. Messent, Esq. ...	5	1 0	60	24·22	...
* „ (Whitley)	Rev. R. F. Wheeler ...	5	0 11	83	23·45	...
Stamfordham	Rev. J. F. Bigge	8	1 0	400	25·53	...
„ (Church Tower)	„ „ „	12	42 0	456	19·96	...
Hexham (Parkend).....	M. A. Ridley, Esq. ...	11	0 4	277	28·53	216
Bellingham (Hesleyside)	W. H. Charlton, Esq...	10	3 4	420	37·59	...
Hartburn (Wallington)	H. Laws, Esq.....	5	1 0	398	29·03	200
Bellingham (Otterburn)	Rev. T. Wearing	10	1 3	500	31·60	154
Morpeth (Brenckburn Priory) ...	C. H. Cadogan, Esq....	5	1 0	200	33·68	111
Deadwater [on the borders].....	Hawick Farmers' Club	...	...	...	45·50	...
Alnwick (Glanton Pyke)	F. W. Collingwood, Esq	8	0 8	534	27·82	...
Howick	Earl Grey	8	0 10	126	24·98	159
Lilburn Tower	E. J. Collingwood, Esq	10	6 0	290	26·61	...
Belford (Middleton Hall)	J. T. Leather, Esq ...	10	2 0	240	24·20	...
Bamburgh (North Sunderland)...	Rev. F. R. Simpson ...	8	1 2	120	24·40	170
*Wooler (Milfield)	G. A. Grey, Esq.	5	0 4	200	28·45	...
CUMBERLAND.						
Bootle (Whitbeck).....	Rev. T. Ormandy	2	1 0	...	39·10	182
„ (Rectory)	Rev. A. Wilkin..... ...	8	1 0	87	40·61	192
Whitehaven (Braystones)	J. D. Watson, Esq ...	10	3 8	36	33·24	...
„ (Flosh)	T. Ainsworth, Esq.. ...	5	2 0	209	42·74	198
„ (Millgrove).....	I. Fletcher, Esq. F.R.S	8	2 0	210	36·00	...
Scawfell Pike .....*monthly* (4)	„ „ „	4	0 6	3200	59·95	...
Esk Hause ..... „ (6)	„ „ „	4	0 6	2550	95·51	...
Great End ..... „ (5)	„ „ „	4	0 6	2982	74·15	...
†Wasdale Head ..... „ (1)	„ „ „	4	0 6	247	90·79	...
Brant Rigg..... „ (3)	„ „ „	4	0 6	695	75·81	...
Sprinkling Tarn..... „ (7)	„ „ „	4	0 6	1985	117·60	...
Stye Head „ ..... „ (8)	„ „ „	4	0 6	1472	128·35	...
The Stye..... „ (10)	„ „ „	4	0 6	1077	184·71	...
Taylor's Gill .....(9)	„ „ „	4	0 6	1077	163·70	...
†Seathwaite .....*monthly*(11)	„ „ „	4	0 6	422	115·96	...
† „ ..... „ (11)	Mrs. Dixon	8	1 0	422	122·50	...
† „ .....*daily* (11)	I. Fletcher, Esq. F.R.S.	5	1 0	422	133·31	...
Stonethwaite .....*monthly*(12)	„ „ „	4	0 6	330	91·27	...
†Wythburn Parsonage „ (20)	Rev. Basil Lawson ...	8	1 0	574	82·25	...
†Helvellyn (Birkside) „ (21)	G. J. Symons, Esq...	8	1 0	1800	86·50	...
†Watendlath .....(13)	„ „ „ ...	8	1 0	867	77·61	...
Keswick (Barrow House).....(B)	I. Fletcher, Esq. F.R.S.	...	0 0	270	61·65	...
†Penrith (Hallsteads) .....(36)	Mr. Sinclair	10	4 0	490	48·20	...
†Gowbarrow Fell .....(29)	G. J. Symons, Esq...	8	1 0	1100	? 72·10	...
† „ (Watermillock) ...(37)	Mr. W. Rumney	10	3 6	720	43·10	...

NOTE.—The numbers in parentheses on this and two following pages refer to the Map of the Lake District facing page 20.

DIVISION X.—NORTHERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter	Height Above Ground. ft.	in.	Height Above Sea Level	Depth of Rain. 1867	Days on which .01 or more fell.
					feet.	inches	
CUMBERLAND—(*con.*)							
† Matterdale Common .....(28)	G. J. Symons, Esq. ...	8	1	0	1400	? 81·80	...
† Keswick (Crow Park) .....(15)	H. C. Marshall, Esq...	10	4	0	260	44·10	...
† „ (Derwent Island) ...(14)	„ „ „	5	1	0	240	50·06	220
† „ (Post Office) .....(16)	Mr. Crosthwaite	5	1	0	270	52·14	156
† „ (Greta Bank) .....(17)	J. J. Spedding, Esq. ...	5	1	0	400	50·67	...
† Skiddaw .....(18)	G. J. Symons, Esq....	8	1	0	1677	56·60	...
† Bassenthwaite (Mirehouse)	Mrs. Spedding	5	0	7	310	42·87	183
Cockermouth (Whinfell Hall) ...	W. Robinson, Esq. ...	5	2	0	266	46·73	213
Workington (Stainburn)	C. Litt, Esq.	8	0	6	101	32·87	186
„ (Park End)	W. Thompson, Esq....	5	1	2	124	31·88	191
Cockermouth	Dr. Dodgson	8	0	6	158	38·35	185
„ (on a post)	„ „ „	8	6	6	164	36·29	...
„ (on Church Tower) ...	„ „ „	8	100	0	260	20·07	...
„ (Tarnbank)	I. Fletcher, Esq., F.R.S.	8	0	6	225	37·89	187
„ „	„ „ „	10	5	0	230	36·78	187
„ „	„ „ „	12	40	0	272	27·61	182
„ (Higham)	T. A. Hoskins, Esq. ...	8	0	6	478	36·54	185
„ (Oakhurst)	T. Drane, Esq.	8	0	6	190	33·50	...
„ (Bridekirk)	Rev. J. Carter	8	0	6	350 ?	34·43	...
Penrith.....	T. Lester, Esq.	5	0	9	...	28·43	176
† „ (Edenhall).....	Mr. T. Bowstead	5	1	0	320 ?	27·90	...
Alstone.....	J. Dickinson, Jun., Esq.	...	3	0	1150	39·27	231
„ (Nenthead).....	W. Dalton, Esq	5	1	0	1416	38·66	...
Wigtown (Brayton Hall)	I. Fletcher, Esq. F.R.S	...	1	0	120 ?	27·97	...
Silloth	Rev. F. Redford	8	3	0	28	26·48	171
Carlisle (Cemetery).....	Mr. J. Cameron, Jun.	8	0	0	114	22·20	154
WESTMORELAND.							
Kirkby Lonsdale (Casterton).....	S. Morris, Esq.	8	1	0	267	47·87	196
„ „ (Biggins House)	Miss Tomlinson.....	12	3	6	400	48·14	...
„ „ (Whelprigg) ...	Mrs. Gibson	5	3	0	475	46·17	...
„ „ (Rigmaden) ...	E. Wilson, Esq.	6	3	0	350	51·95	...
„ „	Mr. W. Harrison	5	1	2	209	47·42	...
„ „ (Vicarage)	Rev. H. Ware	5	1	1	210	47·77	...
† Kendal.....	S. Marshall, Esq.	8	4	6	149	47·31	169
„ (Underfell)	„ „ „	...	...		...	46·42	184
Stavely (Middle Fairbank)	T. K. Atkinson, Esq...	10	3	0	...	64·42	...
Windermere (High House)	E. Hayton, Esq.....	8	4	0	636	52·55	172
„ (The Wood)	G. B. Crewerson, Esq.	8	3	2	310	67·40	195
„ (Ibbotsholme) ...	S. Taylor, Esq.	8	1	6	180	57·05	...
† „ (The Howe) (35)	Admiral Wilson	8	1	2	470	77·83	151
Elterwater .....(23)	E. B. W. Balme, Esq.	8	1	0	200	? 79·10	..
† Ambleside (Low Nook) .....(27)	J. C. Wilson, Esq.....	5	1	2	170	71·79	224
† „ (Lesketh How) ...(26)	Dr. J. Davy, F.R.S....	8	3	0	200	76·56	...
† Grasmere (High Close) .....(22)	E. B. W. Balme, Esq.	8	0	9	553	74·62	...
† „ „ („ „) (22)	„ „ „ „ „	5	0	9	553	75·74	211
Loughrigg Fell ... .(24)	„ „ „ „ „	8	1	0	1050	65·25	...
Rydal .....(25)	F. M. T. Jones, Esq...	5	1	6	185	71 26	...
Langdale .....(19)	E. B. W. Balme, Esq.	8	1	0	380	100·50	...

DIVISION X.—NORTHERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1867 inches.	Days on which ·01 or more fell.
WESTMORELAND—(*con.*)							
*Kirkby Stephen	T. Mason, Esq.	5	1	1	574	30·93	...
†Kirkstone Pass.....(34)	G. J. Symons, Esq...	8	1	0	1500	?82·40	...
†Grasmere (Easedale Tarn) ...(A)	,, ,, ,, ...	8	1	0	1175	91·00	...
†Shap (Wet Sleddale) .....(42)	,, ,, ,, ...	8	1	0	1500	?87·00	...
†Haweswater(Mardale Green)(40)	,, ,, ,, ...	8	1	0	800	84·50	...
† ,, (Measandbecks) (41)	,, ,, ,, ...	8	1	0	1200	50·75	...
†Patterdale Hall ..... (33)	Mr. Sinclair	7	2	0	490	72·43	185
Appleby	Dr. Armstrong	8	1	0	442	34·55	181
†Ullswater (Swarth Fell).....(39)	,, ,, ,, ...	8	1	0	1000	42·75	...
,, (Sharrow Bay)...(38)	A. Parkin, Esq.....	8	1	6	500	32·34	...
†Great Strickland [Penrith] (44)	H. Plumer, Esq.....	5	1	6	650	33·55	166
†Brougham Hall [Penrith].....	Mr. G. Campbell	5	1	0	470	28·25	123

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS.

MONMOUTH.							
*Newport (Isca Foundry)	J. Laybourne, Esq. ...	5	1	0	...	39·41	...
* ,, (Llanfrechfa Grange) ...	F. J. Mitchell, Esq. ...	5	1	0	360	38·96	140
Chepstow.....	J. G. Wood, Esq.	8	3	6	200	35·01	147
,, (The Mount)	H. Clay, Jun., Esq. ...	...	...		...	29·61	...
*Newport (Abercarn)	Rev. D. Charles.....	5	1	3	450	48·04	141
Tintern Abbey.....	Mr. W. Bowen	5	1	0	16	36·10	148
Tredegar (Blaina)	J. H. Soper, Esq.	5	0	9	1100	51·86	180
,, (Ebbw Vale)	P. James, Esq.	5	1	0	918	52·77	146
,, (Sirhowy)	R. Jordan, Esq.....	5	0	9	1055	55·07	210
Abergavenny	Dr. McCullough	5	1	3	...	34·83	174
Monmouth (Dingeston).....	S. R. Bosanquet, Esq.	5	1	3	300?	24·85	...
GLAMORGAN.							
*Cowbridge (The Ham)	G. W. Nicholl, Esq. ...	8	1	2	55	34·40	175
Cardiff (Town Hall)	T. Waring, Esq.....	5	1	1	20	37·02	181
,, (Ely)	T. G. South, Esq.	5	2	0	45	37·45	159
,, (Pentyrch)	F. G. Evans, Esq.....	5	1	1	100	48·91	213
,, (Lisvane)	T. G. South, Esq.....	5	2	0	142	37·24	185
Swansea	J. W. James, Esq.....	12	14	9	30	32·13	164
Aberdare (Dare Villa)	Evan Jones, Esq.	5	1	6	440	59·85	...
MerthyrTydfil (Thomas Town)...	T. J. Dyke, Esq.....	5	2	0	550	51·74	162
CARMARTHEN.							
Llanelly (West End Terrace) ...	D. M. Llewellyn, Esq.	5	0	10	20	43·63	233
,, ...	E. Bagot, Esq., C.E....	5	7	0	20	38·48	211
Llanstephan...	W. Ainslie, Esq.....	5	0	5	35	35·78	207
*Carmarthen—(Plas Cwrt Hyr)...	W. E. Gwynn, Esq....	5	1	0	90	50·71	154
,, (Gaol)	G. Stephens, Esq.....	8	3	6	72	42·04	212
Llandissilio (Rhydwen).....	H. S. Morgan, Esq. ...	10	1	0	150	46·06	146
PEMBROKE.							
Milford.....	H. Edwards, Esq.....	8	1	0	130	41·04	177
*Haverfordwest	E. P. Phillips, Esq. ...	5	1	0	85	55·87	139

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS—(*continued*)

AUTHORITIES.	STATIONS.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1867 inches.	Days on which ·01 or more fell.
CARDIGAN.							
Kilgerran (Castle Malgwyn).....	Rev. D. Evans	5	1	2	30	40·64	170
Lampeter ..... (63)	Rev. J. Matthews	8	5	0	420	42·63	180
Aberystwith (Logylas) .....(61)	W. Ball, Esq.....	5	4	0	600	55·46	...
„ (Frongoch Mine) (60)	„ „	5	3	6	730	56·61	...
Llanidloes(Ystrad-olwyn-fawr)59	J.F.BatemanEsqF.R.S	...	...		950	46·90	...
Aberystwith (Capel Bangor) (57)	T. Paul, Esq.	5	1	0	50	42·71	209
BRECKNOCK.							
Crickhowell (Glanusk Park).....	Mr. Ireland	8	0	6	300	41·47	...
Brecknock	J. Kirk, Esq...	5	2	0	450	42·76	161
Hay (Pen-y-maes)	Captain Brown	5	1	1	317	32·68	174
RADNOR.							
*Presteign	Captain Hannam	5	1	0	550	33·60	196
Rhayader (Cefnfaes) ..... (62)	Mrs. Jones	5	2	0	880	40·96	...
MONTGOMERY.							
Llanidloes (Broomcliff) .....(56)	T. F. Roberts, Esq. ...	5	3	10	750	52·11	180
Head of R. Clwyedog) .....(55)	J.F.BatemanEsqF.R.S	...	...		1300	84·70	...
Carno (Capel) .....(54)	„ „ „	...	...		550	65·80	...
Garthbibio (Lluest fawr).....(49)	„ „ „	...	...		1100	58·90	...
Llanwddyn .....(47)	„ „ „	...	...		720	67·40	...
Head of River Vyrnwy .....(46)	„ „ „	...	...		2000	81·70	...
FLINT.							
Mold (Bryn Alyn)	Rev. R. B. Cooke	5	1	3	450	31·73	...
†Hawarden [Chester]	Dr. Moffat	8	1	0	270	27·41	...
Holywell (Maes y dre)	J. Williams, Esq.	10	5	0	400	24·77	...
St. Asaph (Brynbella).....(33)	P. P. Pennant, Esq. ...	...	1	0	280	28·64	...
*†Rhyl (Gas Works).....(31)	Mr. E. Evans.....	5	4	2	20	22·61	...
DENBIGH.							
Chirk (Brynkinalt).....	Mr. Hall.....	8	0	9	...	28·71	100
Wrexham (Brymbo)	C. E. Darby, Esq.....	6	6	3	620?	29·05	...
„ (Gwersyllt Hill)	W. Lassell, Jun., Esq..	4	2	0	400?	27·90	104
†Llandudno (Warwick House) (29)	Dr. Nicol.....	8	0	6	99	31·98	167
MERIONETH.							
*Dolgelly.....(21)	Captain Mathew	5	1	0	43	63·32	196
* „ (Brithdin) .....(28)	J. Hill, Esq.	5	2	0	500	53·64	...
Bala .....(20)	Captain Mathew	5	1	0	544	49·49	197
*Festiniog (Blaenyddol) .....(3)	„ „	5	1	0	600	74·60	234
*Rhiw brifdir.....(15)	„ „	5	10	0	1140	98·68	252
Corwen (Rhug) .....(37)	W. Wagstaff, Esq. ...	8	3	6	500	31·65	...
CARNARVON.							
Aberdaron (Sarn).....(22)	Mr. W. Jones.....	12	5	0	340	41·16	202
*Pwllheli (Bodfaen) .....(17)	Captain Mathew	5	...		...	39·86	217
*Llanystumdwy (Talarvor) ...(16)	„ „	5	3	0	50	38·50	197
*Llangybi.....(6)	„ „	5	1	1	200	46·10	198
*Port Madoc.....(1)	„ „	5	3	0	10	50·20	201
†*Beddgelert (Sygun).....(5)	„ „	5	5	6	330	?98·11	...
Clynnog.....(18)	„ „	5	1	0	70	45·07	194

NOTE.—The numbers in parentheses on this and the following page refer to the Map of Wales forming the frontispiece to this work.

DIVISION XI.—MONMOUTH, WALES, AND THE ISLANDS— *continued.*

AUTHORITIES.	STATIONS.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1867	Days on which .01 or more fell.
			ft. in.	feet.	inches.	
CARNARVON—*con.*						
*Llanllyfni (Cilgwyn) .....(13)	Captain Mathew	5	1 0	500	36·55	199
*Bettws y Coed .....(14)	„ „	5	1 2	70	57·90	175
†*Llanberis (R. Vict. Hotel) ...(9)	„ „	5	1 0	370	71·95	176
* „ (Dinorwic Quarry) (10)	„ „	5	1 10	850	63·44	183
* „ (Glyn Padarn) .....(8)	„ „	5	1 0	377	61·32	220
Carnarvon (Cocksidia).....(39)	„ „	5	1 1	120	36·98	205
* „ (Plas Brereton) ...(7)	T. Turner, Esq.	5	1 0	25	35·60	197
*Bethesda (Penrhyn Quarry)..(11)	Captain Mathew	5	5 0	1000	57·77	194
* „ (Brynderwen) .....(12)	„ „	5	1 0	550	56·44	190
†Llanfairfechan .....(26)	R. Luck, Esq.....	5	0 8	150	34·86	150
ANGLESEA						
Menaifron .....(23)	Rev. W. W. Williams	5	4 9	17	34·20	205
Bidorgan (Llangadwaladr)	H. D. Owen, Esq.....	...	3 0	50	34·31	...
Beaumaris (Henllys) .....(30)	Miss Hampton	...	1 6	150	32·88	...
Llanfairynghornwy .....(24)	Captain Mathew	...	5 0	120	34·99	193
ISLE OF MAN.						
Calf of Man	Bd. of Northern Lights	...	0 10	325?	21·92	...
Douglas Head	„ „ „	...	0 6	...	43·60	...
Point of Ayre	„ „ „	...	3 4	27?	26·85	...
GUERNSEY.						
Guernsey	Dr. Hoskins, F.R.S. ...	12	12 0	204	37·07	170
„ (Grange Road).....	Dr. Mansell	5	1 3	150	37·72	172
JERSEY.						
Millbrook	P. Langlois, Esq.	5	1 0	50	34·57	187
ALDERNEY.						
Alderney	J. May, Esq.	12	10 0	48	27·23	175
SARK.						
Sark Parsonage	Rev.T.L.V.Cachemaille	5	1 0	340	30 68	176

SCOTLAND.

DIVISION XII.—SOUTHERN COUNTIES.

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1867	Days on which ·01 or more fell.
			ft. in.	feet.	inches	
WIGTOWN.						
Mull of Galloway	Bd. of Northern Lights	...	...	...	26·71	...
*Wigton (N. Balfern)	T. MacLelland, Esq.	5	1 0	50	36·90	208
Stranraer (South Cairn)	Mr. J. Kennedy	3	0 4	209	50·85	185
Corsewall	Bd. of Northern Lights	...	3 4	22 ?	32·26	...
KIRKCUDBRIGHT.						
Little Ross	Bd. of Northern Lights	...	3 3	130 ?	21·65	...
*Dalbeattie	J. Grieve, Esq.	5	0 8	25 ?	41·16	193
Castle Douglas (Slogarie)	T. R. Bruce, Esq.	3	1 0	800	54·03	...
„ „ „	„ „ „	8	6 0	300	51·92	...
Cargen [Dumfries]	P. Dudgeon, Esq.	3	0 3	80	31·08	130
New Galloway	R. McKay, Esq.	8	20 0	200	45·71	195
* „ (Waterside)	P. Dalziel, Esq.	5	0 5	215	49·57	178
„ (Glenlee)	Mr. W. Melville	3	1 6	217	50·40	...
*Carsphairn	J. Hannah, Esq.	5	3 11	600	55·94	150
DUMFRIES.						
Annan (Warmanbie)	Rev. F. Redford	8	3 0	100	35·04	177
„ (Comlongon Castle)	W. Hartley, Esq.	5	1 2	80	35·10	...
Dumfries (Crichton Asylum)	Dr. Gilchrist	10	0 3	159	36·10	227
„ (March Hill Cott.)	Mr. T. Hogg	5	0 5	70	34·52	196
Canonbie School	J. Little, Esq.	...	0 9	140	40·70	...
Clenchfoot	„ „ „	...	0 9	400	39·22	...
Thornhill (Glencairn)	Rev. R. Home	6	0 9	350	48·26	196
Kirkpatrick Juxta	Mr. Burgess	3	0 5	346	56·85	185
Wanlockhead	Mr. G. Dawson	3	0 4	1330	58·65	185
Langholme	J. Little, Esq.	...	0 6	270	56·20	...
Westerkirk School	„ „ „	...	0 6	420	51·20	...
Eskdale. Ewes School	„ „ „	...	0 6	407	47·70	...
Carlesgill	„ „ „	10	2 0	370	53·05	210
„ (Hill Top)	„ „ „	...	0 9	1164	59·45	...
Eskdalemuir School	„ „ „	...	0 6	612	54·60	...
ROXBURGH.						
Liddlesdale (Whithaugh)	J. Little, Esq.	...	0 6	400	50·05	...
New Castleton (Kirndean)	Miss Elliot	3	1 0	370	40·80	...
„ „ (The Flatt)	J. Elliot, Esq.	3	0 9	330	42·40	...
Hawick (Borthwickbrae)	A. E. Lockhart, Esq.	8	0 2	800	47·60	...
„ (Goldielands)	Dr. Elliott	...	0 9 ?	505	32·15	...
„ (Lynnwood)	„ „ „		0 6 ?	387	27·00	...
* „ (Silverbut Hall)	Mr. D. Elder	5	4 0	512	27·99	200
„ (Langraw)	W. Oliver, Esq.	5	0 6	570	32·31	...

DIVISION XII.—SOUTHERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Rain Gauge. Height Above Ground.	Rain Gauge. Height Above Sea Level	Depth of Rain. 1867	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
ROXBURGH—*(con.)*						
Hawick (Kirkton)	Hawick Farmers' Club	...	0 6?	...	25·70	...
*Jedburgh (Sunnyside)	G. Hilson, Jun., Esq.	5	10 0	360	20·82	...
Galashiels	Dr. Somerville	5	0 4	365	31·08	206
„ (Wooplaw)	J. Murray, Esq.	5	0 9	880	32·65	211
Kelso (Springwood Park)	Sir G. Douglas, Bt	10	1 0	130	21·28	148

DIVISION XIII.—SOUTH-EASTERN COUNTIES.

PEEBLES.						
Traquair (The Glen)	A. Buchan, Esq.	...	0 4	765	31·18	...
Peebles (Lyne)	T. Kelly, Esq.	5	0 9	560?	30·64	132
Penicuick (N. Esk Reservoir)	Mr. J. Garnock	11	0 6	1150	33·50	143
BERWICK.						
Swinton (Milne Graden)	A. Buchan, Esq.	...	...	103	22·70	137
Lauder (Thirlestane Castle)	Mr. J. Whitton	3	0 3	558	27·25	...
Dunse (Mungo's Walls)	Mr. J. Thompson	3	0 6	267	28·15	188
St. Abb's Head	Bd. of Northern Lights	...	0 4	211?	20·41	...
HADDINGTON.						
Prestonkirk (Smeaton)	Mr. J. Black	7	8 0	100	24·94	163
Haddington (Millfield)	Mr. T. Dods	6	4 6	140	27·00	...
East Linton	Mr. J. Storie	3	0 3	90	21·31	...
Drem (Fenton Barns)	G. Hope, Esq.	3	0 10	103	22·90	...
EDINBURGH.						
Cobbinshaw Reservoir	J. Deas, Esq., C.E.	6	0 7	863	38·60	143
Colinton (Fernielaw)	J. Leslie, Esq., C.E.	11	0 6	500	38·00	...
Dalkeith (Millerfield Ho)	M. J. Miller, Esq.	10	0 6	...	30·16	204
Inveresk	Mr. McAuslane	9	2 0	60	31·11	151
Edinburgh (Charlotte Square)	J. Leslie, Esq., C.E.	11	0 6	230	31·04	...
„ „ „	„ „ „	11	63 0	300	20·80	...
Inchkeith	Bd. of Northern Lights	...	3 0	182?	17·69	...

DIVISION XIV.—SOUTH-WESTERN COUNTIES.

LANARK.						
Douglas (Newmains)	Mr. J. Russell	2	0 2	783	41·87	163
Uddingston (Meadowbank)	J. Anderson, Esq.	5	13 0	75	28·40	...
Lanark	Captain Thornton	5	1 0	505	30·24	221
Wilsontown	J. Mundell, Esq.	5	0 10	900?	37·21	201
Hamilton (Murdostoun Castle)	Mr. Armour	10	4 0	550	32·12	175
„ (Auchinraith)	R. Ker, Esq.	10	4 2	150	29·77	...
„ (Bothwell Castle)	Mr. A. Turnbull	10	18 0	147	27·66	174
Glasgow (St. George's Road)	M. J. Bell, Esq.	...	1 0	140	36·64	...
„ (Cessnock Park)	R. Hart, Esq.	10	4 4	30	32·80	...
„ (Observatory)	A. Buchan, Esq.	...	...	180	44·33	216
Baillieston	Mr. P. Jarvie	6	0 3	230	45·41	216

DIVISION XIV.—SOUTH-WESTERN COUNTIES—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground	Height Above Sea Level	Depth of Rain. 1867	Days on which .01 or more fell.
			ft. in.	feet.	inches.	
LANARK—(*con.*)						
Coatbridge (Woodside House)	J. Baker, Esq.	5	1 2	275	33·20	202
Shotts (Hillend House)	Mr. D. Thompson	10	7 0	620	31·03	187
AYR.						
Girvan	Mr. P. Paterson	...	0 6	15	42·59	155
New Cumnock (Whitehills)	W. Lennox, Esq.	5	1 0	860	45·96	209
Ayr (Auchendrane House)	E. Cathcart, Esq.	8	2 3	96	42·11	199
„ „	„ „	5	0 0	94	42·73	199
Dalry (Blair)	Captain Blair, R.N.	...	0 0	150	56·33	207
Kilmarnock (North Craig)	J. M. Gale, Esq., C.E.	12	0 6	330 ?	40·15	...
Largs (Mansfield)	Dr. Campbell	10	0 6	30	44·00	...
„ (Brisbane House)	„ „ „	10	0 9	125	50·20	...
RENFREW.						
Gorbals's District. Ryat Lynn	‡Glasgow Water Works	8	0 5	310	42·80	128
Gorbals's District. Waulk Glen	„ „ „	12	0 5	280	45·60	132
Gorbals's District. Middleton	„ „ „	12	0 5	550	54·05	...
Gorbals's District. Black Loch	„ „ „	8	0 5	700	49·95	...
Mearns (Newton)	P. R. Murdoch, Esq.	...	0 8	360	46·90	...
„ (Nither Place)	W. Mather, Esq.	10	0 5	350	50·75	...
„ (Kilbarchan)	D. Robie, Esq.	5	0 8	350	60·15	170
Greenock (Shaws W. Works)	Mssrs. Forman & M'Call	...	...	...	63·20	...
„ (Hamilton Street)	J. Gardner, Esq.	6	0 6	50	62·44	229
„ (Gourock)	W. Melvin, Esq.	6	0 6	250	62 69	195

DIVISION XV.—WEST MIDLAND COUNTIES.

DUMBARTON.						
Dumbarton (Cardross)	J. W. Burns, Esq.	3	0 2	50	54·75	169
„ (Balloch Castle)	A. J. D. Brown, Esq.	7	0 4	91	50·00	225
Loch Lomond (Luss), No. 1	A. McDougall, Esq.	5	0 6	70	78·25	...
„ „ „ No. 2	„ „	5	0 6	70	76·20	...
„ „ (Glen Mucknirn)	„ „	3	0 4	250	100·00	...
„ „ (Stuckgown)	Captain Ainsworth	...	2 4	100 ?	87·87	228
„ „ (Ardlui)	A. McDougall, Esq.	3	1 6	50 ?	109·10	...
„ „ (Firkin)	„ „	3	0 5	100	86·70	...
Loch Long (Arddaroch)	J. White, Esq.	5	1 0	80	70·50	191
„ „ (Arrochar)	A. McDougall, Esq.	3	0 6	20 ?	91·10	...
STIRLING.						
Mugdock Reservoir	Glasgow Water Works	8	0 6	320	40·10	114
Falkirk (Rerse)	Earl Zetland	...	...	...	30·95	...
Stirling (Polmaise Gardens)	Mr. Gorrie	...	0 1	12	40·40	...
BUTE.						
Pladda	Bd. of Northern Lights	...	3 3	55 ?	40·58	...
Cumbrae	J. Miller, Esq.	6	4 9	50	34·40	...
ARGYLL.						
Mull of Cantire	Bd. of Northern Lights	...	...	279 ?	46·00	...

‡ Information supplied by J. M. Gale, Esq., C.E.

DIVISION XV.—WEST MIDLAND COUNTIES—*(continued.)*

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1867	Days on which ·01 or more fell.
			ft. in.	feet.	inches.	
ARGYLL—*(con.)*						
Campbeltown (Devaar)	Bd. of Northern Lights	...	3 4	75 ?	44·85	...
Islay (Eallabus)	R. Ballingal, Esq.	3	0 1	70	46·91	197
„ (Rhinns)	Bd. of Northern Lights	...	3 0	74 ?	31·78	...
„ (Mc Arthurshead)	„ „ „	...	0 4	106 ?	67·50	...
Castle Toward	Mr. McIntosh	5	4 0	65	55·03	207
Lochgilphead (Kilmory)	Sir J. P. Orde, Bart.	6	0 4	100	65·20	217
„ (Callton Môr)	Mr. J. Russell	3	4 6	65	52·66	219
Lochgoilhead (Upper Glencroe)	A. McDougall, Esq.	3	0 6	400	124·30	...
Loch Fyne (Cairndow No. I.)	„ „	3	0 5	30	80·72	...
„ „ („ No .II.)	„ „	8	0 5	30	79·32	...
*Mull (Ardfenaig)	W. Murray, Esq.	5	1 2	20	64·51	171
„ (Duart)	A. Fletcher, Esq.	5	1 0	...	77·96	...
Inverary Castle	Mr. J. Caie	4	0 1	30	68·00	...
Dalmally (Bridge of Orchy)	A. McDougall, Esq.	3	0 6	600 ?	90·00	...
Lismore	Bd. of Northern Lights	...	3 4	37 ?	46·38	...
Loch Eil (Corran)	„ „ „	...	0 4	14 ?	76·30	...
Sound of Mull	„ „ „	...	0 6	12 ?	62·01	...
Ardnamurchan	„ „ „	...	3 6	82 ?	37·45	...
„ (Camusinas)	J. J. Dalgleish, Esq	5	0 2	40	90·30	221

DIVISION XVI.—EAST MIDLAND COUNTIES.

KINROSS.						
Loch Leven Sluice	Mr. P. Farnie	...	0 10	...	31·00	...
FIFE.						
Burntisland	Miss Macbean	...	0 6	80	29·21	191
„ (Parsonage	A. Buchan, Esq	...	...	...	29·14	176
„ (Duncarn)	J. Kerr, Esq.	12	0 3	500 ?	33·73	...
Balfour	Mr. J. Dewar	3	0 6	129	31·05	136
Leven (Nookton)	W. McG. Miller, Esq.	5	0 6	80	30·76	181
Isle of May	Bd. of Northern Lights	...	2 2	182 ?	19·38	...
St. Andrews (Feddinch Mains)	Mr. R. Muirhead	5	0 6	300 ?	28·72	...
Cupar (Birkhill)	Mrs. Wedderburn	5	0 5	130	29·66	...
PERTH.						
Culross (West Grange)	J. J. Dalgleish, Esq.	...	0 2	116	20·64	123
Menteith (Cardross House)	Mr. Wyber	8	1 0	120	40·70	...
Aberfoyle	Glasgow Water Works	8	0 6	60	50·00	137
Dunblane (Kippenross)	J. Stirling, Esq.	6	0 4	100	25·70	...
Deanston House	J. Finlay, Esq.	6	0 2	130	44·15	212
Loch Dhu	Glasgow Water Works	8	0 6	325	78·50	191
Loch Drunkie	„ „ „	8	0 6	420	57·20	...
„ Vennachar	„ „ „	8	0 6	275	55·20	158
Bridge of Turk	„ „ „	8	0 6	270	50·70	153
Loch Katrine (Tunnel Hill Top)	„ „ „	8	0 6	830	73·40	...
Callander (Leny)	J. B. Hamilton, Esq.	3	0 6	345	57·50	...
Between Glen Finlas & Ben Ledi	Glasgow Water Works	8	0 6	1800	53·00	...

DIVISION XVI.—EAST MIDLAND COUNTIES—(*con.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1867	Days on which ·01 or more fell
			ft. in.	feet.	inches.	
PERTH—(*con.*)						
Glen Gyle	Glasgow Water Works	8	0 3	380	98·90	193
Auchterarder House	Lieut.-Colonel Hunter	8	2 3	162	32·85	151
Crieff (Muthill)	Rev. A. J. T. Morris...	3	0 10	247	48·07	200
Auchterarder (Trinity Gask)	Mr. R. Wylie	3	0 1	133	33·72	134
Perth Academy	Dr. Miller, F.R.S.E.	15	64 5	79	24·60	...
„ (Balthaycock)	Mr. Wedderspoon	7	2 0	356	32·90	...
„ (Inchbank)	Dr. Miller, F.R.S.E.	10	1 6	20	32·85	...
„ (Early Bank)	Mr. Macglashan	12	0 3	64	50·78	...
Scone Palace	Mr. J. Halliday	6	4 0	80 ?	27·16	113
Glen Almond (Logie Lodge)	Mr. J. Stewart	2	4 6	1022	39·00	...
Stanley	Rev. W. Mather	5	2 0	200	27·93	...
Blairgowrie (Rosemount)	R. Geekie, Esq.	8	6 1	300	26·99	148
Aberfeldy (Bolfracks)	J. F. Wyllie, Esq.	12	0 6	360	41·40	...
*Logierait (Strath-tay)	Rev. G. D. R. Munro..	5	1 0	250	34·03	164
FORFAR.						
†Dundee (Hermon Hill)	R. Adamson, Esq.	...	0 0	116	32·75	...
† „ (Westfield Cottage)	C. Clark, Esq.	...	9 0	50	27·61	169
† „ (Eastern Necropolis)	Mr. W. R. McKelvie	3	0 5	164	28·30	122
†Barry Village	Mr. J. Proctor	...	0 3	35	31·52	208
†Craigton	‡Dundee Water Works	11	0 3	481	33·86	...
†Crombie Reservoir	„ „ „	11	0 3	522	33·78	...
Kettins	Mr. J. Gibb	4	1 0	218	33·65	133
†Hill Head	Dundee Water Works	11	0 3	570	35·51	...
Arbroath	A. Brown, Esq.	8	2 0	65	28·88	140
Montrose (Bridge Street)	D. Scott, Esq.	11	0 3	25	26·80	...
„ (Museum)	Mr. J. Campbell	7	29 0	37	22·85	205

DIVISION XVII.—NORTH EASTERN COUNTIES.

KINCARDINE.						
Brechin (The Burn)	Lieut.-Col. McInroy	6	0 6	237	34·10	...
Fettercairn	Mr. A. C. Cameron	4	0 3	221	37·30	192
†Banchory House [Aberdeen]	A. Thomson, Esq.	6	0 4	99	33·40	250
Girdleness [Aberdeen]	Bd. of Northern Lights	...	4 7	86	23·90	...
ABERDEEN.						
Braemar	Mr. J. Aitken	8	0 9	1110	32·36	205
Ballater	J. W. Paterson, Esq.	5	0 9	656	35·61	242
Drumoak (Drum Castle)	Mr. G. Gammie	...	...	...	31·50	...
Cromar (Coldstone)	Rev. J. G. Michie	5	4 0	680	38·34	...
Aberdeen (Pitmuxton)	Rev. A. Beverly	10	1 0	14	28·92	...
† „ (Rose Street)	A. Cruickshank, Esq.	8	0 4	95	29·77	...
„ (Skene St.)	Rev. A. Beverly	5	4 8	107	31·51	225
„ „ „ *monthly*	„ „ „	5	4 8	107	29·29	...
„ (Grammar School) „	„ „ „	5	1 6	96	33·98	...
„ („ „) „	„ „ „	5	8 6	103	28·14	...
„ („ „) „	„ „ „	5	63 10	161	26·30	...
„ (Military Hospital)	Sergt. Turner	8	0 6	61	28 66	193

Information supplied by J. Duncan, Esq.

DIVISION XVII.—NORTH EASTERN COUNTIES—(*continued*).

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground.	Height Above Sea Level	Depth of Rain. 1867	Days on which .01 or more fell.
			ft. in.	feet.	inches.	
ABERDEEN—(*con.*)						
Aberdeen (Military Hospital) ...	Sergt. Turner.....	8	24 6	88	24·99	...
,, (Wallfield) *monthly*	Rev. A. Beverly	5	3 4	162	29·17	...
Alford (Bogside, Leochel).....	W. Bruce, Esq.	5	3 0	882	37·50	188
Strathdon (Castle Newe)	Mr. A. Walker	5	1 0	915	33·32	249
Inverury (Kenmay)	Rev. G. Peter.....	8	0 0	307	42·45	...
,, ,, ...	,, ,, ,,	8	0 7	307	35·97	...
,, (Manse)	Rev. J. Davidson	9	0 1	210	39·47	...
Ellon (Tillydesk)	Mr. W. Hay	11	0 4	349	40·41	...
Peterhead (Buchanness)	Bd. of Northern Lights	...	3 4	35?	29·42	...
Old Deer (Manse)	Rev. J. Peter	...	0 4	145	31·58	...
Turriff (New Byth).....	Mr. A. Henderson.....	5	0 3	391	38·48	...
New Pitsligo	Mr. D. Sturrock	3	0 3	501	37·07	243
Kinnairdhead	Bd. of Northern Lights	...	3 4	64?	22·27	...
BANFF.						
Gordon Castle.....	Mr. Webster	8	1 6	70	26·65	...
ELGIN OR MORAY.						
Craig Ellachie (Knockando Ho.)	W. E. Cattley, Esq. ...	5	0 9	...	31·42	...
Elgin (Ashgrove)	W. Topp, Esq.	8	0 3	33	27·79	208
,, (Institution)	A. Buchan, Esq.....	...	...	50	28·77	...

DIVISION XVIII.—NORTH-WESTERN COUNTIES.

WEST ROSS.‡							
*Loch Alsh (Inverinate House) ...	Mrs. Matheson	5	3	0	150	60·72	144
*Applecross	Dr. Haynes	5	1	0	50	55·33	224
*Lochbroom	Mr. M. Macleay	5	0	8	47	50·32	240
Isle of Lewis (Stornoway)	Bd. of Northern Lights	...	3	4	31?	25·65	...
,, (Lewis Castle)	Mr. McDougall	8	0	3	60	28·95	185
,, (Bernera)	Mr. J. Macdonald	8	0	6	18	48·71	...
,, (Butt of Lewis)	Bd. of Northern Lights	...	3	6	...	40·54	...
EAST ROSS.‡							
*Dingwall	J. Boyd, Esq.	5	0	11	20?	28·33	196
Cromarty.....	Bd. of Northern Lights	...	3	4	28?	21·43	...
*Invergordon Castle.....	B. B. Æ. McLeod, Esq.	...	3	0	20	25·94	156
Alness (Ardross Castle).....	Mrs. Matheson	5	1	0	450	39·27	228
*Tain (Fearn)	Mr. M. McLean.....	5	1	3	48	27·11	194
Tarbetness	Bd. of Northern Lights	...	3	4	61?	19·27	...
WEST INVERNESS.							
*Fort William	Rev. W. Simpson	5	0	8	20	68·09	235
Loch Nevis (Inverie).....	Mr. N. Macdonald ...	5	2	6	18	82·90	...
Isle of Skye (Oronsay).....	Bd. of Northern Lights	...	0	6	15?	71·40	...
,, (Kyle Akin).....	,, ,, ,,	...	0	2	3?	90·20	...
,, (Raasay)	Mr. T. Bunning.....	12	3	0	80	67·75	142
,, (Portree)	Mr. J. Grant	3	0	4	60	78·75	202

‡ Including Cromarty.

DIVISION XVIII.—NORTH-WESTERN COUNTIES—(*continued*).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain.	Days on which ·01 or more fell.
		Diameter.	Height Above Ground.	Height Above Sea Level	1867	
			ft. in.	feet.	inches.	
WEST INVERNESS.—*(con.)*						
Isle of Skye (Portree)	Mr. J. Grant	5	0 4	60	80·57	202
,, (Waternish)	Rev. J. Lamont	5	0 4	150	93·55	193
,, (Uig Lodge)	Mr. J. Grant	3	0 4	10	67·47	189
,, (Rona)	Bd. of Northern Lights	...	0 6	196 ?	32·05	...
Barrahead	,, ,, ,,	...	3 0	640 ?	26·81	...
S. Uist (Ushenish)	,, ,, ,,	...	0 4	157 ?	48·43	...
N. Uist (Monach)	,, ,, ,,	...	...	...	40·40	...
Harris (Island Glass)	,, ,, ,,	...	3 4	50 ?	36·16	...
EAST INVERNESS.						
*Laggan	Mr. A. McIntosh	5	0 9	1000 ?	39·86	228
Strath Errick (Farraline)	Capt. Fraser	4	0 6	700	34·05	...
Glen Urquhart (Carrimony)	T. Ogily, Esq	3	0 6	360 ?	32·60	195
Strathspey (Grantown)	Mr. W. Duncan	5	1 2	710	29·46	...
*Beauley (Beaufort Castle)	Mr. W. Anderson	5	0 8	65	33·52	164
Inverness (High School)	J. Robertson, Esq.	5	1 3	15	28·57	183
,, (Culloden House)	A. Forbes, Esq.	...	3 0	104	26·31	...
Glen Strathfarrer	Mr. McKenzie	5	2 0	...	64·36	248

DIVISION XIX.—NORTHERN COUNTIES.

SUTHERLAND.						
*Invershin	Mr. G. Young	5	4 0	20	35·83	...
Golspie (Dunrobin Castle)	Mr. J. Mitchell	3	0 6	6	27·16	180
*Helmsdale	Mr. J. Campbell	5	1 0	34	36·47	216
House of Tongue	J. Crawford, Esq.	4	0 1	33	38·80	262
Cape Wrath	Bd. of Northern Lights	...	3 6	355 ?	28·04	...
CAITHNESS.						
Wick (Pultenay House)	Capt Rutherford, R.N.	5	3 8	70	30·99	209
,, (Nosshead)	Bd. of Northern Lights	...	3 4	127 ?	24·68	...
Thurso (Holburnhead)	,, ,, ,,	...	0 4	60 ?	34·73	...
Dunnethead	,, ,, ,,	...	3 6	300 ?	30·30	...
Pentland Skerries	,, ,, ,,	...	3 3	72 ?	26·62	...
ORKNEY.						
South Ronaldsay (Roeberry)	W. H. Gray, Esq	5	1 2	150	32·67	201
Hoy (Melsetter)	J.G. Heddle, Esq.	4	0 4	55	38·87	...
,, (Cantickhead)	Bd. of Northern Lights	...	...	...	38·40	...
,, Graemsay Sound (East)	,, ,, ,,	...	3 4	27 ?	33·62	...
,, ,, (West)	,, ,, ,,	...	...	37 ?	25·86	...
*Pomona (Holm Manse)	Rev. O. Scott	5	1 4	30 ?	26·04	...
† ,, (Kirkwall)	Mr. J. G. Iverach	3	0 4	8	37·24	...
Shapinsay (Balfour Castle)	D. Balfour, Esq	3	0 3	50	37·60	...
†Pomona (Sandwick)	Rev. C. Clouston, LL.D.	...	2 0	78	39 39	243
Sanda (Start Point)	Bd. of Northern Lights	...	0 6	29 ?	36·65	...
*Papa Westray	Rev. C. Clouston, LL.D.	5	...	80 ?	36·06	192
North Ronaldsay	Bd. of Northern Lights	...	3 4	21 ?	25·01	...
SHETLAND.						
Sumburghead	Bd. of Northern Lights	...	3 4	265 ?	25·42	...
Bressay	,, ,, ,,	5	0 4	60	35·13	...
*East Yell	Mr. A. D. Mathewson	5	1 0	176	41·81	...

IRELAND.

DIVISION XX.—MUNSTER.

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1867 inches.	Days on which ·01 or more fell
CORK.							
Cork (Queen's College)	Professor England	10	6	0	65	42·69	190
„ (Royal Institution)	Dr. Caulfield	10	50	0	70	31·95	115
Fermoy	A. Campbell, Esq.	9	4	0	114	31·62	200
Mallow (Woodfoot)	G. S. Ware, Esq.	5	5	6	205	33·92	212
KERRY.							
Knightstown (Valentia)	The Knight of Kerry	8	1	2	110	52·59	237
Killarney (Muckross Abbey)	Mr. Breese	12	4	0	24	49·99	213
WATERFORD.							
Waterford (Newtown)	Mr. R. J. Greer	..	4	0	60	39·15	217
„ (Glenville)	M. D. Hassard, Esq	...	1	6	76	36·06	...
„ (Portlaw)	C. Barker, Esq.	24	20	0	50	41·14	153
„ (Rathculliheen)	.....	...	1	8	140	32·18	...
TIPPERARY.							
Clonmel (Glenam)	Miss Grubb	5	1	10	80	39·37	215
„ (Bruce Villa)	J. H. Grubb, Esq.	5	1	6	85?	35·74	...
Carrick on Suir	J. E. Grubb, Esq.	5	2	7	28	40·45	222
Tipperary (Cordangan Manor)	L. Cust, Esq.	5	18	0	284	31·88	190
„ (Ballykisteen)	Jasper Bolton, Esq.	5	1	1	350	36·08	202
*Borrisoleigh (Ballinlonty)	Mr. Kearns	5	1	2	...	35·30	102
CLARE.							
Killaloe	Rev. C. Mayne	10	5	0	123	46·87	196

DIVISION XXI.—LEINSTER.

WEXFORD.							
Wexford (Reclaimed Lands)	C. W. Palliser, Esq.	10	0	2	1	27·71	130
New Ross (Rosbercon Cas.)	A. E. Graves, Esq.	8	2	3	45	32·42	103
Enniscorthy (Ballyhyland)	J. Moffat, Esq.	5	1	0	420	38·32	215
Gorey (Courtown House)	Earl Courtown	5	3	0	80	33·64	161
KILKENNY.							
Inistogue (Woodstock)	Rt. Hon. W. F. Tighe	5	4	0	400	34·50	...
*Stoneyford (Inisnag)	Rev. J. Graves	...	1	0	196?	27·02	208
Gowran Castle	Mr. Whitelaw	5	1	0	205	28·66	194
CARLOW.							
Bagnalstown (Fenagh)	R.C.Browne, Jun. Esq.	5	1	0	340	32·76	198
Carlow (Browne's Hill)	„ „ „ „	5	1	0	291	29·71	210

DIVISION XXI.—LEINSTER—(*continued.*)

STATIONS.	AUTHORITIES.	Rain Gauge. Diameter.	Height Above Ground. ft.	in.	Height Above Sea Level feet.	Depth of Rain. 1867 inches.	Days on which ·10 or more fell.
QUEEN'S COUNTY.							
Portarlington	Dr. Hanlon	5	1	1	236	29·09	252
KING'S COUNTY.							
Roscrea (Cangort Park)	H. B. Trench, Esq.	5	8	0	340	27·99	203
Parsonstown (Birr Castle)	Hon. R. Parsons	4	0	3	200	28·11	133
Tullamore	H. J. B. Kane, Esq.	10	3	0	235	27·45	214
WICKLOW.							
Carnew (Coollatine Park)	Mr. H. W. Cordle	5	1	0	427	36·54	202
Bray (Fassaroe)	E. Barrington, Esq.	10	5	0	250	35·28	...
DUBLIN.							
Black Rock	T. Bewley, Esq.	12	29	0	95	26·11	136
Monkstown	Arthur Pim, Esq.	10	0	6	100	27·39	194
Dublin (Phœnix Park)	Capt. Wilkinson, R.E.	31	10	0	169	24·01	201
„ (South Anne Street)	J. W Moore, Esq.	5	3	0	50	27·24	187
* Skerries	Rev. T. Greene	5	1	0	12	29·62	219
EAST MEATH.							
Moynalty	J. A. Fanell, Esq.	12	5	0	250	33·15	...

DIVISION XXII.—CONNAUGHT.

GALWAY.							
Gort (Cregg Park)	R. J. Lattey, Esq.	5	3	0	120	36·93	184
Galway (Queen's College)	Prof. Curtis, LL.D.	10	6	0	25	43·09	224
* Lough Corrib (Innishamboe)	J. D. D'Arcy, Esq.	5	1	0	35	45·43	226
ROSCOMMON.							
*Hollywell	H. Smyth, Esq.	5	2	6	...	38·22	166
SLIGO.							
*Buninnadden (Doo Castle)	Mr. D. O'Dowd	5	1	0	...	44·07	...
Collooney (Markree Observatory)	Col. Cooper, M.P.	24	16	3	145	42·21	190
Sligo (Haslewood)	Miss Wynne	2	2	4	47	43·56	170
„ (Mount Shannon)	F. M. Olpherts, Esq.	9	4	5	70	45·58	190

DIVISION XXIII.—ULSTER.

CAVAN.							
*Bawnboy (Owendoon)	G. H. L'Estrange, Esq.	5	1	3	218	49·71	237
*Belturbet (Red Hills)	Rev. E. Whyte Venables	5	0	9	...	38·05	223
FERMANAGH.							
Enniskillen (Florence Court)	Earl of Enniskillen	12	11	0	300	46·96	205
ARMAGH.							
Armagh Observatory	Rev. Dr. Robinson F.R.S	10	1	5	208	36·73	191
DOWN.							
Milltown (Bann Res)	J. Smyth, Jun., Esq. C.E.	8	1	0	440	47·20	110
Banbridge (Milltown)	„ „ „	8	0	8	200	31·93	209
„ „	„ „ „	12	40	0	220	27·30	...

DIVISION XXIII.—ULSTER—(*continued*).

STATIONS.	AUTHORITIES.	Rain Gauge.			Depth of Rain	Days on which ·01 or more fell.
		Diameter.	Height Above Groun d.	Height Above Sea Level	1867	
			ft. in.	feet.	inches.	
DOWN—*con.*						
Waringstown	Capt. Waring	8	0 4	190	33·83	193
„ (*monthly*)	„ „	2	0 4	190	32·97	...
ANTRIM.						
†Belfast (Queen's College)	Mr. W. Taylor	11	9 3	58	32·68	173
† „ (Linen Hall)	J. Stephens, Esq.	11	4 0	12	36·77	195
„ (Old Park)	W. Girdwood, Esq.	6	4 0	224	45·03	224
*Antrim	Rev. J. H. Orr	5	1 0	150	31·72	182
Ballymoney	Rev. T. Knox	5	7 0	170	39·76	253
LONDONDERRY.						
*Garvagh (Moneydig)	H. R. Morrison, Esq.	5	1 1	121	40·16	192
Londonderry	D. Watt, Esq.	8	0 6	150	41·20	...
„ „ „	Rev. F. Smith	12	8 0	90	43·16	226
„ (Literary Institution)	Dr. Cuthbert	12	50 6	78	35·66	194
Bellarena	SirF.Heygate,Bt.,M.P.	5	1 6	12	37·76	245
TYRONE.						
Strabane (Leckpatrick)	Rev. C. Maxwell	8	0 5	260	45·08	221
DONEGAL.						
*Letterkenny	Rev. Dr. Kingsmill	5	0 6	108	54·65	...
Dunglow (Templecrone)	Rev. A. Delap	8	0 6	10	40·99	249

G. J. S.

FINANCIAL.

I am not sure that the details of this branch of rainfall investigations form a very legitimate subject of comment in a publication which anyone can obtain for a few shillings. Suffice it to say, that in 1867 the receipts and expenditure were both greater than in any previous year; they grow with the growth of rainfall investigations, and unluckily, the ratio remains constant, so that there are always a variety of subjects, crippled by the want of that, which is quite as much the sinews of science, as of war. Let me quote an illustration from the case of the investigations of the rainfall in the Lake district; most of their cost is defrayed by Mr. Fletcher, but it is a fact that when, a short time since, I asked for £30 to cover some expenses I had incurred in the matter, the response was £2., and a recommendation to abandon the work! That way of meeting difficulties I decline to adopt, convinced that it would never meet the approval of my fellow-countrymen.

I believe it is only necessary that it should be known that many important branches of rainfall work stand still for want of funds, to secure a considerable increase, but this could be better undertaken by others than by myself.

I am happy to conclude by saying that up to the present date, Feb. 22, the receipts in 1868 have been greater than in the corresponding period of any previous year, but we must not shut our eyes to the fact that the expenses will also be greater, though not perhaps to the same extent.

List of all sums of £1 and upwards received in payment for Books, Diagrams, &c., or as contributions to the general expenses of rainfall investigations in 1868.

	£	s.	d.
Aire & Calder Navigation Co....	1	11	6
Alexander, J., Esq.	1	0	0
Appach, R., Esq.	1	0	0
Assheton, R., Esq.	1	0	0
Backhouse, T. W., Esq	1	0	0
Backhouse, W., Esq.	1	0	0
Baker, W. C., Esq.	1	1	0
Balme, E. B. W., Esq.	2	2	0
Barrington, E., Esq.....	1	0	0
Baylis, H. Esq.....	2	0	0
Bayning, The Lady	1	1	0
Beverly, The Rev. A.	1	0	0
Bewley, T., Esq.	1	0	0
Birkbeck, W., Esq.	1	0	0
Blackmore, R. D. Esq.....	1	1	0
Blake, W., Esq.	2	0	0
Bland, W. Esq.....	1	0	0
Bolton, J. Esq.....	1	5	0
Bosanquet, S., Esq.	1	10	0
Box, A. M., Esq.	1	5	0
Boyd, The Rev. W.	1	0	0
Bridgeman, J.R.O., Hon. & Rev.	1	8	6

	£	s.	d.
Brooke, The Rev. J.	1	0	0
Brown, A. L. D., Esq.	1	0	0
Brown, Captain	1	0	0
Brown, T. C., Esq.	1	0	0
Bumpstead, The Rev. T. J.	1	0	0
Burlingham, R., Esq.	1	4	0
Burrow, Messrs. W. & J.	1	0	0
Casella, L. P., Esq.	1	1	0
Cathcart, E., Esq.	1	1	0
Cator, C. O. F., Esq.	1	10	0
Cattley, W. E., Esq.	1	0	0
Charrington, F., Esq.	1	0	0
Chrimes, R., Esq.	10	0	0
Clarke, E., Esq.	1	0	0
Clarke, Sir James, Bart., F.R.S.	1	0	0
Clarke, The Rev. J. S.	1	0	0
Clegram, W. B., Esq., C.E.	1	1	0
Collins, C. R., Esq.	1	1	0
Coode, W., Esq.	1	0	0
Cooke, The Rev. R. B.	1	5	0
Courtown, Right Hon. Earl of	1	10	0
Cowley, P., Esq.	1	17	6
Darby, C., Esq.	1	7	0
Dartnell, G. R., Esq.	1	0	0
Davey, E. C., Esq.	2	2	0
Davis, T. H., Esq.	1	0	0
Denne, W., Esq.	1	1	0
Devas, W., Esq.	1	0	0
Dines, G., Esq.	1	0	0
Dipple, G., Esq.	1	0	0
Doncaster, D., Jun. Esq.	1	5	6
Doubleday, H., Esq.	1	2	0
Drummond, General	1	15	6
Duncan, J., Esq.	1	0	0
Dymond, E. E., Esq.	1	0	0
Eldon, Right Hon. Earl of	1	0	0
Estlin, J. P., Esq.	1	5	0
Evans, F. G., Esq.	1	6	0
Fawcett, E. G., Esq.	1	2	6
Fawcett, H., Esq.	1	2	0
Ffolkes, The Rev. H.	1	0	0
Field, R., Esq.	1	11	0
Filliter, E., Esq., C.E.	1	13	0
Finlay, J., Esq.	1	0	0
Fletcher, I. Esq., F.R.S.	10	0	0
Forde, Colonel	2	8	0
Freeman, D. A., Esq.	1	5	0
Fuller, F., Esq.	1	1	0
Gale, J. M., Esq., C.E.	1	13	0
Gamlen, W. H., Esq.	1	0	0
Gillet, The Rev. G. E.	1	0	0
Gosset, The Rev. I. H.	1	10	0
Gott, C., Esq.	1	1	0
Grey, The Right Hon. Earl	1	0	0
Griffith, The Rev. C. H.	1	10	0
Harcourt, Colonel	1	0	0
Hare, C., Esq.	1	0	0
Harris, W. J., Esq.	1	12	6
Harrison, W. F., Esq.	1	10	6
Hassard, M. D., Esq.	1	0	0
Herbert, J. M., Esq.	1	0	0
Heygate, Sir F. W., Bart.	1	0	0
Hill, The Rev. E.	1	3	0
Hill, J. H., Esq.	1	0	0
Hills, H., Esq.	1	6	0
Holdsworth, J. G., Esq.	1	0	0
Holland, The Rev. C.	1	1	0
Hony, The Ven. Archdeacon	1	0	0
Hood, The Hon. Major-General	1	0	0
Hopkins, The Rev. T. A.	2	2	0
Horner, Rev. J.	2	15	0
Howard, W. D., Esq.	5	10	0
Hounsfield, Mrs.	1	0	0
Howman, The Rev. E. J.	1	8	0
Hull, The Rev. J.	1	0	0
Hutchings, The Rev. R. S.	1	1	0
Ingram, The Rev. H.	1	12	0
Jefferson, Miss M. C. D.	1	0	0
Jones, Mrs.	1	0	0
Jowers, F., Esq.	1	5	0
Karslake, The Rev. W. H.	1	10	0
Ker, R., Esq.	1	0	0
Lassell, W., Esq. Jun.	1	0	0
Legard, The Hon. Lady	2	0	0
L'Estrange, G. H., Esq.	1	0	0
Lockhart, A. E., Esq.	1	0	0
Lucas, W., Esq.	1	1	0
Lund, C., Esq.	1	0	0
Mackeson, H. B., Esq.	1	5	0
Majendie, The Rev. H. W.	1	0	0
Majendie, L. A., Esq.	1	14	0
Malden, The Rev. C.	1	3	0
Marshall, H. C., Esq.	2	10	0
Marshall, A., Esq.	2	12	0
Matheson, Mrs.	1	10	0
Melville, A. S. L., Esq.	1	1	0
Miller, J., Esq. (Cumbrae.)	1	10	0
Mitchell, F. J. Esq.	1	0	0
Morgan, T. H., Esq.	1	0	6
Murdoch, The Rev. J. B.	1	0	0
Nichol, G. W., Esq.	1	0	0
Nickesson, The Rev. W.	1	2	6
Norris, T., Esq.	2	0	0
North, A., Esq.	1	10	0
Northwick, The Rt. Hon. Lord	2	0	0
Nutter, J., Esq.	1	0	0
Ogilvy, T., Esq.	1	1	0
Orde, Sir J. P., Bart.	1	15	0
Parkin, A., Esq.	1	5	0
Pasley, Admiral Sir T. S.	2	2	0
Paulin, T., Esq.	1	11	0
Paxton, H., Esq.	1	0	0
Pearce, H. S. R., Esq.	1	0	0
Peckover, A., Esq.	1	1	0
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Pennant, P. P., Esq.	1	1	0
Phillips, E. P., Esq.	1	10	0
Pigott, G. Esq.	1	0	0
Pile, G. Jun., Esq.	1	1	0
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Preston, The Rev. T. A.	2	0	0
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Robson, J. W., Esq.	1	0	0
Row, W. N., Esq.	1	10	0
Rutherford, Captain	1	0	0
Rylands, T. G., Esq.	1	0	0
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Shiffner, Miss	1	0	0

	£	s.	d.
Sidebottom, J., Jun., Esq.	2	0	0
Smyth, J., Jun., Esq.	1	0	0
Smith, J., Jun., Esq.	2	2	0
Snow, The Rev. H.	2	0	0
Soames, The Rev. C.	1	1	0
Southall, E. P., Esq.	1	1	0
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Stone, W. H., Esq.	1	0	0
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Strahan, W. Esq.	1	11	0
Strangman, T. H., Esq.	1	2	0
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Whitehead, Doctor	1	1	0
Widdicomb, J., Esq.	1	0	0
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Wingfield, The Rev. C. L.	1	0	0
Winter, The Rev. E. W.	1	2	0
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Woodd, C. H. L., Esq.	1	5	0
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[Subsequent receipts will be acknowledged monthly in the *Meteorological Magazine.*]

G. SHIELD, Printer, 30, Lower Sloane Street, Chelsea.

Just Published, Post 8vo., Price 2s.

RAIN:

How, When, Where, and Why it is Measured;

BEING A POPULAR ACCOUNT OF RAINFALL INVESTIGATIONS, WITH ILLUSTRATIONS,

BY

G. J. SYMONS, F.M.S.,

Editor of British Rainfall, &c.

This work is intended to serve a double purpose, to be a manual for the use of observers, and to provide the public at large with an epitome of the results hitherto obtained, and their application to the wants of civilized life. It also contains interesting particulars of the rainfall in all parts of the world.

OPINIONS OF THE PRESS.

GARDENERS' CHRONICLE, *December 21st*, 1867.

"This is the expressive title of a valuable little treatise on the very important subject to which the author has devoted so much diligent labour. The average amount of rainfall in various stations in Great Britain, thanks to Mr. Symons and his coadjutors, is pretty well known to those interested in such matters. In the present volume, not only will this information be found in a condensed form, but also a table, showing approximately the mean annual rainfall at a large number of stations, widely dispersed over the whole globe. How valuable such a table will be to the gardener we need hardly point out. For instance, the rainfall at Cherrapongee, in India, lat. 25° 16′, amounts to no less than 610·3 in. in the year, while at Kurrachee, in Scinde, the mean fall is stated to be only 3 inches. In the West Indies, also, great variations exist as to the amount of rainfall, as may be seen from the following figures, which we extract from Mr. Symons's tables: 'Antigua, 39·5; Barbadoes, 75; Barbadoes, St. Philip, 56·1; Cuba, Havannah, 50·2; Cuba, Matanzas, 55·3; Grenada, 126; Guadaloupe, Basseterre, 126·9; Matonba, 285·8; Jamaica, Caraib, 97; Kingston, 83; St. Domingo, Cape Haitien, 127·9; Tivoli, 106·7; Trinidad, 62·9; Virgin Isles, St. Thomas, 60·6; Tortola, 65·1.'

"While thanking Mr. Symons for this table, we earnestly wish that he may be able to extend it in the future, so as to render it more accurate, and to enable us to ascertain precisely at what period the greatest or the least quantity of rain falls, and other information of no little consequence to the cultivator of exotic plants. It is clear, from the immense range of variations in the amount of rainfall in places closely adjacent, that there must be potent local conditions of which the table in question tells us nothing. We are, of course, aware, that to furnish such information as would be available for cultural purposes, great labour would be entailed, beyond the power of any individual to accomplish; but as we look upon Mr. Symons' influence to be as great at least as that of the African 'rain makers' over their fellows, we still hope this may be done."

LONDON REVIEW, *December 28th*, 1867.

"Mr. G. J. Symons, the editor of '*British Rainfall*,' &c., has in the little book next in our list, given a complete and intelligible answer to the questions which are often asked as to the method, time, place, and reasons of measuring the rainfall, and there are few who will not derive some information from his pages. The earliest records of rain measurement at present possessed were made at

OPINIONS OF THE PRESS—*(Continued.)*

Townley, in Lancashire, in the year 1677, though little progress was made in reducing rain-measurement to a system till the present century; the system is now very energetically worked, there being no less than 1,500 rain-gauge stations now at work in the British Isles. We must refer our readers who wish to learn more on this interesting subject to Mr. Symons's excellent little handbook."

DUNDEE ADVERTISER, *January 2nd*, 1868.

"The author of this treatise on rain has entered on a very important field of investigation, and a subject deeply interesting to the agriculturist, the engineer, the physician, and those engaged in providing supplies of water for our towns. As complete knowledge of the subject must be based on a vast number of experiments with accurate instruments, the author naturally begins his work with a description and critical examination of the different kinds of rain-gauges used in this country. The question whether the British rainfall has been decreasing, increasing, or stationary has been anxiously discussed. Mr. Symons's tables show that though there have been remarkable yearly vicissitudes, the average over lengthened periods is extremely equal. The fall in different parts of the British Isles varies greatly. It is much greater on the west than on the east coast. Out of 165 stations, the smallest was at Lincoln, Southwell, and Stamford, where the mean annual depth of rain was only 20 inches, and the greatest near Seathwaite, where the moisture of the warm winds from the Atlantic is precipitated by contact with the Cumberland mountains, and where the mean fall was 165 inches, being more than eight times larger than in the midland counties. The details of the water supply of London, with its vast consumption of ninety-six millions of gallons daily, are very interesting to a large community like ours. We are sure that the importance of the subject will secure to Mr. Symons's manual an extensive circulation."

CITY PRESS.

"When a master in any branch of practical science condescends to teach the first elements by way of a cheap book, there is a boon conferred upon the public which it is impossible to praise too highly. We must regard Mr. Symons's book on 'Rain' as a benefaction, for we are all interested in the subject, and few of us understand it. The chapter on the reason 'Why' is admirable, as useful information for everybody, and will startle some folks who have heretofore thought about rain, that there wasn't much in it beyond wetness."

GARDENERS' MAGAZINE, *January 11th*, 1868.

"This is a capital book on a subject that all talk about and few understand. . . Every country, and every particular district of a country, has its peculiarities in respect of rainfall, and on the amount and distribution of rain, the agriculturist and horticulturist must vary and regulate their movements, and the physician must observe the effects on health of the incidence of rainfall. This book will be found generally useful because of its abundant and accurate information, but to the meteorologist it will be especially valuable as an aid in one of the important branches of observation."

SPECTATOR, *January* 25, 1868.

"Each of the questions put on the title-page of this book is answered clearly and conclusively by the book itself. Mr. Symons describes the various kinds of rain gauges, shows the use of measuring rain, and gives a list of the places at which rain falls more or less copiously. Incidentally we have some hints as to the best sources for the supply of water to London, but this is by the way."

MECHANICS' MAGAZINE, *January 18th*, 1868.

"We are glad to renew our acquaintance with Mr. Symons, in a very useful little book on the subject of rain. The author's labours in this department of meteorological science are well known and appreciated; he has now added another proof of his zeal in the cause by the production of a popular account of rainfall investigations.

OPINIONS OF THE PRESS—*(Continued.)*

Rightly apprehending that there are many who would like to learn the interpretation and practical use of the records of rain, Mr. Symons explains the method and results of rainfall measurement in the most simple terms. Being thoroughly at home in his subject, he will be found to interest those who otherwise might be disposed to turn their backs upon the subject. He has succeeded admirably in embodying all the important facts connected with rainfall, illustrating the instruments used in its measurements, and giving ample instructions to those who desire to observe for themselves. Mr. Symons gives an interesting diagram showing the fluctuations in the fall of rain from the year 1726 to 1865, as well as tabular results of recent investigations. The utility of rainfall observations is so well recognized, that we need not here insist on that point. Let those who admit and wish to promote this utility, obtain Mr. Symons' book, and the few simple utensils necessary, and let him then advance the interests of science by making his own observations, and forwarding the results to Mr. Symons."

POPULAR SCIENCE REVIEW, *January*, 1868.

"Who, if not Mr. Symons, is able to speak authoritatively on the various meteorological phenomena of rain and rainfall? To him we owe nearly all that has been done in collecting rain statistics during the last few years, and to him we are indebted for the handy and clearly written little volume which has just been issued. As the title of the book indicates, Mr. Symons treats of the employment of rain gauges. First he tells us how rain is collected. In this part of the work he describes the different forms of gauges now in use, and illustrates his descriptions by woodcuts of seven or eight varieties of the instrument. He dwells at some length on the subject of the receiving service of a rain gauge—should it be large or small? This is a *quæstio vexata* among meteorologists, and it has been a bone of much contention between the author and the *Mechanics' Magazine*, the former asserting that small rain gauges are at least as good as large ones, and the latter advocating the opposite opinion. Mr. Symons gives the results obtained from the observations on the series of experimental gauges at Calne, and from these it certainly seems that the balance of evidence is in his favour; but really the difference is so extremely trifling, that it appears to us as if the combatants in the discussion were fighting for a shadow. The author gives some good practical advice on a point in which amateur meteorologists are much engaged, viz., "setting a gauge to work," which may thus be summarised. The mouth of the gauge should be made perfectly level, and so fixed as to remain so; the instrument should be set on level ground, and at a distance from walls, trees shrubs, &c.; tall flowers should not be allowed to grow near the gauge. The gauge should be emptied daily at 9 a.m., and the amount entered against the previous day. As the snowy season has begun, it is as well to give our readers Mr. Symons' direction for the estimation of snow-fall. There are three modes of doing this:—1. Melt what is caught in the funnel, and measure it as rain. 2. Select a place where the snow has not drifted, invert the funnel, and, turning it round, lift, and melt what is enclosed. 3. Measure with a rule the average depth of snow, and take one-twelfth ($\frac{1}{12}$) as the equivalent of water. On the subjects of when, where, and why rain is measured, our author is just as communicative of facts ascertained by practical experience and of suggestions which will be found useful by the student. But we have already quoted enough to show the value of his little work, and we must now conclude our notice by recommending "Rain" to everyone who is interested in the now popular study of meteorology; they will find it a clear, straightforward guide to the accurate pursuit of weather-science.

[Complete Lists of Mr. Symons's Publications on Rainfall and Meteorology, Blank Diagrams, Registration Books, &c., can be obtained, post free, from the Author or Publisher.]

LONDON:
EDWARD STANFORD & Co., 6, CHARING CROSS;
SIMPKIN, MARSHALL AND CO., STATIONERS' HALL COURT.